THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

COMPUTERWORLD

$2.00 A COPY; $44/YEAR | NOVEMBER 28, 1984 | VOL. XVIII, NO. 48

The evolving human interface
Special Report on data communications terminals
Follows ID/32

In Depth
Executive support systems in action ID/3

The other shoe drops
1,200 laid off at STC/97

IBM Cabling System falls short of mark, user says

University calls prototype system costly, bulky, considers scrapping campuswide installation

By John Dix
CW Staff

PITTSBURGH — An early user of the IBM Cabling System has found the building wiring scheme to be overly space-consuming and expensive — factors that may lead it to abandon plans to use the system in 30 other buildings on its campus.

Carnegie-Mellon University here installed a prototype Cabling System approximately a year and a half ago in a building it was constructing to house its computation center, administrative programming group and information technology center. The last is a joint venture between the university and IBM to develop workstations for educational and research environments.

The four-story structure was wired to Cabling System specifications with cable that IBM donated, said Tom Bajsek, interim director of the computation center. Following the configuration plans, each of the roughly 100 offices in the building was equipped with an outlet that provides separate interfaces for voice and data devices. The outlets are wired in a star topology to wiring closets on each floor, which are, in turn, wired to a central distribution frame in the computer room.

As a prototype, the cable used in Carne-

See CABLING page 4

TOP OF THE NEWS

It's a deal. IBM cleared the final hurdle in its $1.26 billion acquisition of Rolm Corp. when both companies agreed to a U.S. Department of Justice mandate to divest Rolm's military computer business. Justice also said it sees no antitrust implications in the remainder of the proposed acquisition. Page 2.

■

View from the top down. To head off a crisis where time and money would have gone into incompatible systems and duplicate data, the U.S. Nuclear Regulatory Commission took a top-down approach to reorganizing its DP operations. Page 6.

■

Where's the disk? That's what the U.S. Geological Survey has been asking about an optical disk system it has been expecting for more than a year from troubled Storage Technology Corp. Page 13.

■

One-fourth of large software systems under development will be canceled before completion, and three-fourths will experience serious operational difficulties, according to statistics gathered from 200 Fortune 1,000 companies. Page 14.

■

Harris Corp. has unleashed a pair of 32-bit AT&T Unix-based workstations said to deliver more than one-half million instructions per second of processing power and aimed at engineering and software development applications. Page 81.

Users eyeing MVS on 4381 processor

Shops try various paths around virtual storage roadblocks

By John Desmond
CW Staff

PARMA, Ohio — To convert, or not to convert: That is the question for David A. Seman, who, as DP director at Parma Community General Hospital here, has been agonizing over whether to migrate to the MVS operating system when his IBM 4381 mainframe is installed in February.

MVS would free up some precious virtual storage on the hospital's 4341 Model Group 2 running on DOS/VSE under VM, but it costs more. Meanwhile, Se-

See CONVERT page 8

FYI

Prototype net ties Defense systems

By James Connolly
CW Staff

WASHINGTON, D.C. — Five miles of cable running along the walls and through the steam tunnels of the sprawling maze known as the Pentagon are linking U.S. Army office systems produced by seven different vendors.

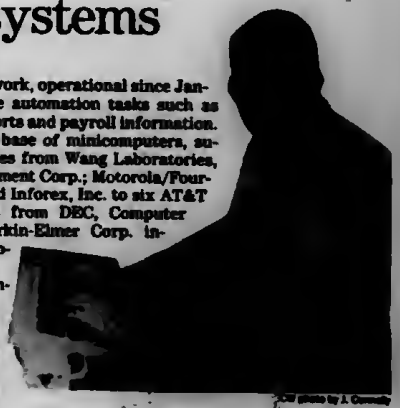
Army officials hope the prototype, a mongrel local-area network, will set a de facto office communications standard for other Army commands and branches of the U.S. Department of Defense.

"We are looking to provide a totally integrated office system for the headquarters of the Army. We want to provide more accurate communications, to move information faster, to improve the efficiency of mid-level officers and to better process secure, classified materials," said Lt. Col. Patrick C. Lanpher, project manager for the Headquarters Integrated Office System. The network, operational since January, is used for office automation tasks such as handling personnel reports and payroll information.

It links an installed base of minicomputers, superminis and mainframes from Wang Laboratories, Inc.; IBM; Digital Equipment Corp.; Motorola/Four-Phase Systems, Inc.; and Inforex, Inc. to six AT&T Unix-based superminis from DEC, Computer Consoles, Inc. and Perkin-Elmer Corp. installed under the prototype project.

But in addition to connecting normally incompatible systems from varied vendors, the Army brought in two different local-area

See ARMY page 8



CW photo by J. Connolly

CW
MI48106UIVYHUIVYM FCWB
UNIVERSITY MICROFILMS
SERIAL PUBLICATIONS
300 N ZEEB RD
ANN ARBOR MI 48106

NEWSPAPER

IBM, Rolm OK sale of unit

Justice Department approval of IBM's Rolm acquisition contingent on divestiture of Rolm military computer business

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — The Department of Justice last week said it would not oppose the acquisition of Rolm Corp. by IBM, provided that the two companies consent to the divestiture of Rolm's military computer business.

Reacting to a civil antitrust suit brought by the Justice Department and to a proposed settlement of the action filed simultaneously Nov. 20 in U.S. District Court here, IBM and Rolm agreed to the divestiture terms specified by the government.

The Justice Department said it reviewed other aspects of the proposed acquisition announced in September, particularly IBM's acquisition of Rolm's private branch exchange business, and concluded that there was insufficient legal basis for challenging those aspects of the acquisition.

IBM to find buyer for Rolm division

As part of the divestiture settlement, subject to a 60-day public comment period, IBM will have six months to find a buyer for Rolm's Mil-Spec Computer Division, which reportedly accounted for 15% of Rolm's $660 million in revenues last year.

The Department of Justice said the challenge to IBM's $1.26 billion takeover of Rolm, brought about two days before Rolm stockholders were to vote on the takeover issue last Wednesday, was prompted by concern that the acquisition would "substantially lessen competition" in the military specification (mil-spec) commercial market, where the manufacturing and sales "are highly concentrated." Rolm had $75 million in mil-spec sales in 1983, which accounted for 50% of total mil-spec sales, according to the suit.

Meanwhile, Rolm stockholders at the company's annual meeting voted overwhelmingly to approve the takeover by IBM, despite the Justice Department's consent decree forcing the divestiture. The vote, IBM said, consummated the merger, adding that Rolm is now a wholly owned subsidiary of IBM.

Assistant Attorney General for Antitrust J. Paul McGrath said in a prepared statement that between 1980 and 1983, Rolm and Norden Systems, Inc., a subsidiary of United Technologies Corp. of Hartford, Conn., accounted for 80% of total annual domestic sales of mil-spec computers, which are manufactured to withstand the rugged environments of military use.

The antitrust suit said there were "substantial barriers" to entry in the mil-spec commercial-based market and that IBM "was by far the most significant of, at most, a few potential entrants" into the market. Additionally, Justice Department lawyers, reviewing the proposed acquisition, found IBM "intended to enter this market and to commence taking orders in 1985."

Other reasons cited in the Justice Department suit noted that many of IBM's commercial products are currently used by the military and that its own mil-spec business, while not based on commercially available architectures and software designs, would give it "unique and significant advantages" in the commercial mil-spec market.

Rolm manufactures mil-spec commercial computers under a series of licenses from Data General Corp. of Westboro, Mass., that are software-compatible with commercially available DG products [CW, Oct. 15].

The Justice Department complaint challenging the Rolm acquisition noted, "it would be unrealistic to expect meaningful competition to exist between IBM and the [Rolm] Mil-Spec Computer Division. Instead of gaining a new competitor, the military would still have only two major firms to vie for its business," the department brief said.

Following the announcement of the proposed divestiture settlement, IBM said, "IBM and Rolm disagree with this contention but have agreed to divest so that the companies might proceed. IBM believes the divestiture in no way diminishes the value of the [Rolm] acquisition to IBM."

If IBM is not able to complete the sale of the division within six months, the proposed final judgment provides that a trustee appointed by the U.S. District Court will be responsible for finding a buyer, which IBM will have to accept.

McGrath said the object of the Antitrust Division was the preservation of the Rolm Mil-Spec Computer Division or its successor "as a significant participant in the market for mil-spec commercial-based computers."

Phillip Verveer, a former Justice Department official who served in the Antitrust Division when it was pursuing its monopoly antitrust suit against IBM, called the department's action "not so surprising, because the department has shown it is amenable to negotiated arrangements where spin-offs of certain assets are required as a condition of approval.

"This action will probably not diminish the department's willingness to let IBM compete aggressively in the markets it decides to enter, and it sounds like in this instance [the department] expects IBM to enter the military computer market," Verveer added.

CW West Coast correspondent Jeffry Beeler contributed to this report.

CORRECTIONS

The correct address for American Business Computer [CW, Oct. 31] is Suite 418, 16000 W. Nine Mile Road, Southfield, Mich. 48075.

"Trends in Information Technology: 1985," a handbook for executives from Arthur Andersen & Co., [CW, Nov. 19] will be updated annually, not monthly as previously reported.

Mark Williams Co.'s C Programming System, a C compiler and source debugger for Microsoft Corp. MS-DOS 2.0 environments [CW, Nov. 5], is distributed by Control-C Software, Inc. of Portland, Ore., but is also available directly from the supplier for $495. Mark Williams is located at 1430 West Wrightwood, Chicago, Ill. 60614.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

NEWS SUMMARY

SPECIAL REPORT
Data communications terminals Follows ID/32

Long-distance rates will drop further if a proposed residential-access charge plan is approved by the Federal Communications Commission/4

The Nuclear Regulatory Commission took a top-down approach to reorganizing its DP operations/6

IBM's recent announcement of the 4381 Model Group 3 opens up options for 4300 series users considering conversion to MVS/8

Storage Technology Corp. has repeatedly failed to deliver equipment to the U.S. Geological Survey, which is seeking to become an STC beta-test site/13

Industry expert T. Capers Jones III recently offered a pessimistic view of domestic software quality/14

Despite IBM's apparent neutrality concerning centralized networks, it reportedly is still promoting centralized control within corporate DP departments/15

In the horticulture business, efficient order processing makes the difference between sales and spoilage/16

One factor was evident at a recent software job fair: Entry-level job seekers need not apply/17

CW at Computer Security Conference: Strategic planning is the key to ensuring computer security . . . Small-systems users need policies and guidelines to help maintain the security of those systems/22-23

TV ads for software are playing to mixed reviews/24

Getting a return on an investment in office automation is hard to quantify/27

CW at RPI AI Meet: A valid definition of artificial intelligence has been lost amid industry jargon . . . To benefit from AI, an organization must first develop a strategy for adopting the technology/28-29

Eight New York banks are linking their automatic teller machines to form a single network/30

Without sophisticated systems integration, an MIS director's job is an impossible one/32

Crime reporting requirements in one state recently served as the test vehicle for the state university's new data base management system/34

Computer modeling techniques are being used to identify and prevent marital conflict/35

UK firms are plagued by misguided DP purchases/36

An IBM-compatible portable led the product offerings from international vendors at Comdex/Fall '84/40

At the recent Comdex/Europe, the keynote speaker had a gloomy forecast for the future of Europe's high-tech growth/44

IN DEPTH
Support systems for executives/ ID/3
Evaluating micro-based systems/ ID/17
Trends in software protection/ ID/27

Washington Update/12
International Report/46
Turnaround Time/47
Calendar/56

EDITORIAL/58
SOFTWARE & SERVICES/63
COMMUNICATIONS/77
SYSTEMS & PERIPHERALS/81
MICROCOMPUTERS/90
COMPUTER INDUSTRY/97

ADR® WARE™
ADR/eMAIL®.

You may be just one program away from true office automation.

ADR/eMAIL is the software that makes the automated office truly automated.

It starts with speed. ADR/eMAIL delivers information throughout your organization—be it across the hall or around the world—at close to the speed of light.

But speed is hardly all of it. ADR/eMAIL will also file your messages electronically, discarding the ones you choose to discard. It provides an index showing author, subject and date, just like a paper filing system. But without taking the time or space of a paper filing system. Any e/MAIL message you want to locate, you can. Instantly.

When you receive your mail through ADR/eMAIL, you can read it, make notations on it, even forward it, just like an ordinary letter. But it exists electronically so it can't be misplaced like an ordinary letter.

ADR/eMAIL allows you to route your message to as many people as you wish. Or as few. Whichever you prefer. You can store routing lists of the people you frequently copy, and ADR/eMAIL will send them all messages at the touch of a button. You can assign an urgency to your message to make sure it gets priority treatment. And ADR/eMAIL will inform you when it has been viewed. ADR/eMAIL security features insure that only the parties you choose receive your message. And message encryption is available for even more sensitive environments.

And talk about having your cake and eating it too, if you'd like a paper copy, ADR/eMAIL will provide you with it.

And with ADR/eMAIL, electronics are only half the story. Economics are the other half.

ADR/eMAIL reduces paperwork and paper flow, reduces administrative time and costs, reduces telephone expenses, reduces mail and telex expenses and reduces training expenses because its simple, user-friendly end-user interface requires no data processing experience and little training.

Best of all, ADR/eMAIL is software you can have without spending a penny on hardware. You probably have everything you already need; an IBM (or plug compatible) mainframe, CRTs, 328X printers, PCs, TTY dial-ups and TP networks.

In short, you've already paid most of the price for total office automation. So why not start taking advantage of it.

With ADR/eMAIL.

Call 1-800-ADR-WARE or do something that's fast becoming old fashioned—mail us the coupon.

Before you make a software decision mail in the coupon below. Or call in N.J. (201) 874-9000 or toll free 1-800-ADR-WARE

APPLIED DATA RESEARCH INC.
Route 206 & Orchard Road, CN-8, Princeton, NJ 08540

Please send me more information about ADR/eMAIL:

Name_____

Position_____

Company_____

Address_____

City_____ State_____ Zip_____

Phone Number_____

Computer Equipment_____

ADR® WARE™

From idea to application, we get you there faster.

CW 11/26/84

Access charge OK may prompt AT&T rate cut

WASHINGTON, D.C. — A 6.5% long-distance rate reduction by AT&T Communications is expected next year following disclosure of the latest federal and state plan to levy a residential access charge of $1 per month that will help defray the local rate subsidy currently paid by carriers.

Additionally, state utility commissions may be empowered to levy an additional 35 cent fee on top of the residential access charge if it can be shown that large communications users have plans to bypass the local telephone company. Also the plan contains provisions that would permit state public utility commissions to grant "discounts" on the $6 multiline business access fees currently in effect for large businesses if it can be shown they are constructing bypass facilities.

These features of a federal and state plan were approved by a specially convened joint board Nov. 15 and sent to the Federal Communications Commission, which is expected to approve them Dec. 19.

Charge to raise estimated $2 billion annually

Ronald Choura, a Michigan public utility commission employee, estimated that the $1 a month residential access charge, which will also be applied to single-line business customers, will raise $2 billion annually, of which $1.8 billion could be applied toward "dollar-for-dollar" reductions of AT&T Communications' costs of $28 billion, or approximately 6.5%.

FCC Chairman Mark Fowler asked that the proposed plan be given a fair hearing by Congress, which in the past has raised objections to any access fee levied on consumers.

Originally, the FCC proposed a $2 monthly fee for residential customers that would have risen to $4 maximum.

The new joint board recommendation to levy a $1 monthly fee, if approved by the FCC, would go into effect June 1985 and rise to $2 in June 1986, where it would be frozen. The joint board also recommended that the access fee for Centrex customers who were using the service before July 27, 1983 be retained at $2 per line per month.

CABLING from page 1

gie-Mellon's system varies slightly from the commercial version now available. Bajzek said their version has only three pairs of twisted-pair wire for voice applications, rather than the four now included. The director believes IBM increased the number of pairs in the commercial cable — which also contains two shielded twisted-pair wires for data applications — to accommodate AT&T's System 85 private branch exchange (PBX).

The university does not presently use the voice copper pairs in its cable for that application. The reason, Bajzek said, is because the university is a Centrex customer and the Cabling System was installed before it became legal to own internal telephone wiring. Carnegie-Mellon's voice pairs are currently used to support RS-232 connections but probably will be retrofitted for voice when the university turns out Centrex for a PBX.

'I don't think that we would have considered the Cabling System if IBM hadn't said that this is where IBM networking is going.'
— Tom Bajzek, Carnegie-Mellon University

While the Cabling System in this building has performed admirably and provided flexibility in the installation and relocation of equipment, lessons learned here have made the university think twice about using the system throughout its campus.

The cable itself is inflexible and bulky, Bajzek said. It is similar in size to a 25-pair key set wire, or roughly ¾ in. in diameter. On floors with many offices, "this amounts to a massive load of cable running back to the wiring closet," he noted.

The bulk of the wire and the need for wiring closets creates a space problem. To wire the campus with 10,000 outlets to support roughly 5,000 to 7,000 workstations would require the university to convert about 40 offices and dormitory rooms into wiring closets, Bajzek estimated.

The wire's bulk also contributed to installation expenses. It cost about $100,000 to wire Bajzek's building as it was being built, or roughly $400 per outlet. Extrapolating these figures, taking into consideration the fact that it will cost more to wire existing campus buildings, Bajzek projected it will cost roughly $7 million to $9 million to wire the university with the Cabling System, or about $700 per outlet.

This is two to three times what Carnegie-Mellon had initially predicted it would cost to wire the campus with wide bandwidth communications facilities, an estimate that was made before the Cabling System was announced. The cost is so high, in fact, that the university is now considering alternatives.

One option is to install an Ethernet local network for data and to wire separately for a voice system. Bajzek thinks this alternative would be cheaper but not substantial enough to make the decision simple. In either case, telephone wire throughout the campus will have to be replaced because its placement is poorly documented.

A technology that was not considered as an option was combining voice and data support on a PBX. Bajzek said he did not believe that a PBX could deliver the megabit speeds that he anticipates will be needed in the future. Diskless workstations, for example, may require such high-speed network connections, he said.

The fact that future bandwidth requirements are unknown is an important thought in a plan of this sort, Bajzek noted. "This is a long-term investment, and one thing we don't want to do is sell ourselves short and buy a network that doesn't have enough bandwidth for the things that we might want to do later."

In the Cabling System's favor is IBM's statement of intent to build a token-passing local network that will be based on the wiring scheme. "I don't think that we would have considered the Cabling System if IBM hadn't said that this is where IBM networking is going," Bajzek said. In the interim, the university is using a Proteon Associates, Inc. Pronet token-ring network on the Cabling System installed in its first building.

The Pronet is used mostly in a Digital Equipment Corp. Decnet to support six of the computing center's Decsystem-20s and VAX-11/780s for host-to-host communications. Bajzek said that Proteon has assured him that it will be compatible with IBM network products when they are announced. He anticipates, however, that initially the networks will have to be operated separately and connected by drivers.

DOS/VSE and CICS/VS Frustration?

BIM gets it out of your system.

BIM presents a line of proven programs that maximize your system's capabilities, saving you time, labor and expense. These program products help get the most out of your system and people.

BIM-EDIT — the editor with more than 25 significant features that ICCF can't match.
BIMSPOOL — Prints output in POWER/VSE spooling queue on local or remote 3270 terminal printers. (Received ICP Million Dollar Award 1982).
BIMSPOON — On-Line to Batch Print Spooling. Prints data passed from CICS application programs into the POWER spooling queue.
BIM-PDQ — POWER Dynamic Queuing performance enhancement. Eliminates 85% of the I/O to heavily used POWER queue.
BIM-DIAG — Comprehensive problem analysis and display of operational CICS system. DOS and OS.
BIMTEXT — Word processing, document composition system. Creats formatted documents from free-form input.
BIMWINDOW — Multiple terminal sessions concurrently at CRT under DOS or OS VTAM.
BIMSWAP — Switch local 3270 BTAM terminals between multiple CICS partitions without special hardware or additional ports.
BIMCMPRS — CICS 3270 data compression system. Reduces response time for remote terminals significantly. Available for OS/VS1 and MVS also.
BIMECHO — Copies one CRT's output to another or printer for problem determination and demonstration.
BIMP3270 — Comprehensive CRT screen image print facility. Copy to terminal printers or spool queue for system printer.
BIMSERV — On-line display of library directories and entries. VSAM Catalog entries, disk VTOC's, etc.
BIMCMSOL — Multiple/Remote System Console function for CICS. Display-only or full input/display versions available.
BIMMONTR — DOS/VSE System Status, Performance Measurement, and POWER Queue display.
BIMSUBMIT — On-line Job Edit and Submission facility.

BIM programs are cost-efficient, many less than $800, highest $4000. You can save even more with our group package offerings. Products are available on permanent, annual, or monthly licenses, and shipped on a 30-day free trial basis. Product documentation is available on request.

BIM also performs systems programming consulting, with consultants based in Minneapolis and Washington, D.C. Computer time services are also available on our 4331-2 system, on-site or remote.

BIM
B I MOYLE ASSOCIATES, INC.
5788 Lincoln Drive
Minneapolis, MN 55436
612-933-2885
Telex 297 893 (BIM UR)
Member Independent Computer Consultants Assn

Second-class postage paid at Framingham, Mass., and additional mailing offices.

Computerworld (ISSN-0010-4841) is published weekly, except: January (6 issues), February (6 issues), March (5 issues), April (7 issues), May (5 issues), June (7 issues), July (6 issues), August (5 issues), September (7 issues), October (7 issues), November (6 issues), December (5 issues) and a single combined issue for the last week in December and the first week in January by CW Communications/Inc., 375 Cochituate Road, Box 880, Framingham, Mass. 01701.

Copyright 1984 by CW Communications/Inc. All rights reserved.

Computerworld can be purchased on 35 mm microform through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106. *Computerworld* is indexed: write to Circulation Dept. for subscription information.

PHOTOCOPY RIGHTS: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Communications/Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 21 Congress Street, Salem, Mass. 01970.

Permission to photocopy does not extend to contributed articles followed by this symbol. ‡

Special requests should be addressed to Nancy M. Shannon, CW Communications/Inc., 375 Cochituate Road, Box 880, Framingham, Mass. 01701. ISSN 0010-4841/84 $3.00 + $.50. $2.00 a copy: U.S. — $44 a year; Canada, Central & So. America — $110 a year; Europe — $165 a year; all other countries — $245 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin.

ABP

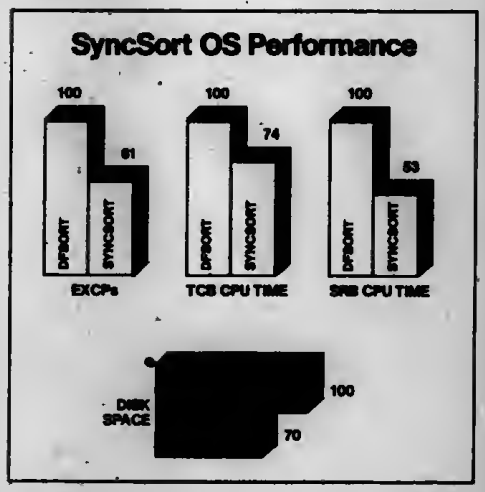
POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, Circulation Department, 375 Cochituate Road, Box 880, Framingham, Mass. 01701.

THE BEST COMPOSER SHOULD HAVE THE BEST PIANO

What could be more fulfilling in life than to realize one's absolute potential? And what could be sadder than to fail for lack of the proper equipment?

"Rousing Performance"

SyncSort allows you to perform like a virtuoso, drawing out the best your ***IBM Mainframe*** has to give.



If OS isn't your tune, you'll find our CMS and DOS performance equally impressive.

"Impressive Backstage Support"

Our Technical Service people, resolving more than 85% of all requests for technical service within 24 hours, will make you look like a star. A recent independent survey showed that 97% of SyncSort's users rate our product reliability as Very Good or Excellent.

"Harmonious Features"

SyncSort's features will impress even the most jaded impressarios, increasing programmer productivity and operational flexibility.

- Sortwriter—displays sorted data in user-tailored reports. Programmer efficiency is maximized through flexible report formatting of headers, trailers, sectioning, totals and subtotals.
- Multiple Output—provides multiple copies of the sorted output file. Each output file can be any subset of the full sorted output, and you can produce a different report format for each output file based on user-specified criteria.
- Record Editing—allows insertion of literals, commas, $, etc. as well as editing, repositioning or elimination of record fields, thereby reducing programming time.
- Fast File Copy—dramatically reduces the consumption of mainframe resources. All standard sorting features (Include/Omit, Inrec/Outrec, Sum, etc.) as well as SyncSort's unique features can be activated in a normal copy operation.
- Maxsort—provides powerful operational flexibility in sorting very large files. Sorting of these files is automatically broken into optimal steps, executable at different times; thus, the amount of data that can be sorted is no longer restrained by the amount of disk space available.

syncsort INC.

SyncSort—for those who abhor wasted potential
Make us prove it: **Call (201) 568-9700.**

Syncsort Incorporated 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

Shake-up streamlines NRC's DP functions

By James Connolly
CW Staff

BETHESDA, Md. — An agency that licenses nuclear power plants could not afford to stow potentially life-saving information in local computers, where those who needed it did not know about it or could not access it through their own systems.

By reorganizing with a top-down management approach, the U.S. Nuclear Regulatory Commission (NRC) headed off a crisis where time and money would have gone into incompatible systems and duplicated data. Now, the NRC has started work on an agencywide shared data base, has limited redundant programming and is directing microcomputer spending at approved equipment and software.

The agency, with 3,400 employees spread throughout the Washington, D.C., area, five field offices and about 60 nuclear power sites, has 50 data processing workers to maintain equipment, train users and coordinate time-sharing services and contracted software development.

In 1982 the NRC reorganized its DP operations, replacing a system where individual users too often called the shots for equipment purchases and program development.

"Before all of this, all system development was from the bottom up instead of from the top down. We would go into an office, and everything would be office-specific. We were too customer-specific," reported Harold S. Bassett, director of automated information services.

NRC formed a steering group to cope with limited resources, technological advances and end-user computing. The committee, made up of executives and DP managers, advises management on computer purchases and policies.

Bassett said that in 1982, the NRC was like other agencies and corporations — plagued by a yearlong backlog for application development and subject to demands for microcomputers. The agency imposed a limited moratorium on application development, allowing only what Bassett termed "very, very important" programs.

CW photo by J. Connolly

Harold Bassett (left), director of the NRC's automated information services, and James Shields, chief of the NRC's systems support branch.

But the agency, spun off from the Atomic Energy Commission in 1975, had no mainframe, and thus, no central data base. Developing that data base, whether on a purchased, time-shared or service bureau mainframe, is one key to the ongoing reorganization.

The bulk of the NRC's processing is done on Data General Corp. minicomputers located throughout the U.S., handling administrative tasks such as personnel and payroll. One machine does small-scale scientific modeling, and another is being installed in an operations center that was inspired by the 1979 emergency at Pennsylvania's Three Mile Island facility.

"Back then, we were in the 3- by 5-in. cards tacked to the wall era. We were somewhere between the Pliocene and Miocene ages then," said Bassett of the Three Mile Island crisis. During an emergency or test, the operations center's DG MV6000 will track information such as weather conditions, radiation dose assessments and construction details about the specific plant.

The agency maintains two time-sharing agreements, one for complex scientific projects running on the U.S. Department of Energy's Control Data Corp. Cyber 205 supercomputers and another for management applications on the National Institutes of Health's IBM 3084 mainframes.

The institute's system will host a pilot project giving the NRC commissioners executive-level tools such as vote-tracking and scheduling.

The agency also has developed a network of 21 IBM 5520 office automation systems that access the institute's mainframe and handle word processing and document transfer tasks. In the field, plant inspectors write reports on personal computers and transmit them to the 5520s for editing.

Like other organizations, the NRC was faced with controlling the proliferation of microcomputers.

"At the end of fiscal year 1983, we had two personal computers in the agency. By the end of calendar year 1984, we will have more than 200, and by the end of next year we will have 300," Bassett said.

But to ensure compatibility, the agency now supports only micro software approved by the steering group. The agency is testing or has approved project management, spreadsheet, data base management, word processing and communications packages for various types of users, most of whom use IBM Personal Computers and compatibles.

Hands-on training on those packages, the 5520s, personal computers and the other NRC systems is being handled in a training laboratory run by the U.S. Department of Agriculture and in a support center recently opened here. More than 450 employees applied for 200 seats in the classrooms.

"Recognizing that a service organization's work never ends, our plans for the corporate information environment see about three to four years into the future. We conservatively estimate that by that time NRC will have a workstation-to-staff ratio of roughly 1:2. In a phased fashion between [fiscal year 1985] and [fiscal year 1989], our users will be able to access and share information from all our major data bases utilizing marketplace technology," Bassett said.

VisiCorp

has sold its VisiOn technology to

Control Data
Business Information Services

a division of

Control Data Corporation

The undersigned initiated this transaction and assisted VisiCorp in the negotiations.

Alex. Brown & Sons
Incorporated

November 21, 1984

MITRON'S STD 1600 TRANSFERS DATA AT 56 KB OFF-LINE TAPE-TO-TAPE

Mitron's STD 1600 provides an efficient method for sending and receiving data anywhere in the world. STD 1600s communicate with each other and with other companies' bisynchronous terminals and computers.

The STD 1600 solves machine compatibility problems. It transfers data reliably without mailing tapes. It can communicate off-line to relieve an overworked computer.

STD 1600s transfer data at speeds up to 56KB. Double-buffering eliminates delays caused by read/write cycle times.

The STD 1600 can be leased or purchased.

STD 1600 features:

- Easy-to-install
- Needs no software
- Data rates to 56KB
- RS-232 or V.35
- Dial-up or private line
- Multiplexers
- 800 or 1600 bpi
- 1200' or 2400' reel sizes
- Bisynchronous protocol
- Transparent or non-transparent
- Space compression
- Variable size records to 16K
- Labels and multiple files

STD 1600 options:

- Autodialing
- Asynchronous
- Code conversion
- Modem eliminator

The STD 1600 is compatible with AT&T's Digital Data Service.

Since 1969, Mitron's magnetic tape systems have been used in a wide variety of data communications applications. Let one of our Applications Engineers explain how you can connect the Mitron STD 1600 to your system or data communication network. Call 800-638-9665. (In Maryland, call 301-992-7700.)

MITRON
Systems Corporation
2000 Century Plaza, Columbia, MD 21044

CONVERT from page 1

man has been able to delay his decision with some imaginative moves to give himself more virtual storage, deflecting some "very aggressive" marketing by IBM in the process, he said.

"IBM has a big push on to get users into the 3083 and MVS. That's across the country. Everywhere I've been going, I've been hearing that," Seman said. But because he suspected that a dual-processor 4381 would be released, Seman has been reluctant to go to the 3080 series. His intuition proved correct, since IBM announced the 4381 Model 3 in October (CW, Oct. 29). "It doesn't make sense for me to go to a 3083, with the 4381 dual processor coming out," he said.

For many mid-range IBM shops, the recent announcement of the high-end 4381 presents an option that previously was not attractive. The Model 3's high performance now makes it practical for 4300 series users to convert to the MVS operating system without having to buy into the bigger and more expensive 3080 series mainframes. However, the choice presents both advantages and disadvantages to users.

Analyst Dave Moschella of International Data Corp. (IDC), a market research and consulting firm located in Framingham, Mass., said prior to announcement of the 4381 Model 3, "running MVS/XA on the 4300 series was not a good idea," because the operating system occupied so much of main memory. IDC is predicting that IBM will cut prices on the 3080 series X models before year's end to counteract the price-performance gap with the 4381 Model 3, Moschella said.

The cost of MVS is the main disadvantage. Seman said it would cost him $5,000 more per month in licensing fees to run MVS and $15,000 more per month to run MVS/XA, which, he said, IBM is advising him he needs. An advantage of MVS for Seman would be added virtual storage. "We keep running out of virtual storage," he said. "I don't know if we can stay where we're at. But every time we go to make a conversion to MVS, we find a way around it." For example, he recently acquired a data base management system from an independent software vendor that takes the place of his Vsam files, freeing some virtual storage and buying him some time.

John Sawilchik, technical support manager in the DP department at the Robert Bosch Corp. of Broadview, Ill., an automotive replacement parts seller, is trying to weigh the greater performance of MVS against its cost. He was told by IBM that his 4381 will operate at only 80% efficiency without MVS. "You have to balance that with higher software costs," he said. The software costs, though he did not have specific prices, would be 10% to 15% higher than what he is paying now, in addition to the cost of converting his applications.

> *'The biggest fear everyone has is being left out of the mainstream of operating system development. You don't follow the trunk of the tree, but you don't get too far out on the limb either.'*
> — Tom McGinley, Epsilon

Sawilchik, whose shop installed a 4381 Model Group 2 in October, is leaning toward a move to MVS from DOS/VSE under VM. At a recent seminar in Chicago, he said IBM was offering the first six months of MVS free if the system was bought in 1984. "If you were on the verge of making a decision, that might push you over," he said.

For another user who has already decided to move to MVS software, the 4381 Model 3 announcement resulted in hardware savings. Tom McGinley of Epsilon in Burlington, Mass., a marketing and data base firm serving Fortune 1,000 firms, recently decided to upgrade to a 4381 Model Group 3 instead of converting to the 3083 EX model. The firm currently has four 4341s and two 4381s powering 300 terminals serving clients in the field and 100 terminals running IBM's CMS internally.

Epsilon needs room for expansion, McGinley said. The 4381s now running OS/VS1 will be converted to MVS/SP in the spring. "It was something we recognized we had to do," because OS/VS1 was no longer being updated by IBM, McGinley said.

But when converting from National Advanced Systems, Inc. mainframes last spring, Epsilon opted for IBM 4381s instead of a 3080 series X model, in a gamble that IBM would announce a higher end 4381. The gamble paid off when the Model 3 was announced because that CPU provides an estimated millions of instructions per second rate equivalent to the low-end 3080 series. "The savings was $600,000 per processor," McGinley said.

Epsilon was attracted to MVS for its greater power, although McGinley said he has some doubts. "Are you just pushing data around or are you getting processing done?" he asked. But staying current is an overriding concern for Epsilon. "The biggest fear everyone has is being left out of the mainstream of operating system development. You don't follow the trunk of the tree, but you don't get too far out on the limb either," McGinley said.

Another analyst says the decision on whether to convert to MVS or MVS/XA depends on a user company's long-term plans. Michael Geran, vice-president of research at E.F. Hutton, Inc. in New York, said, "MVS/XA is where IBM is going. Users will have to convert eventually, but a number of interim steps can be taken" to delay conversion. Users who are processing their applications on time and who have enough virtual storage can delay the conversion to MVS, he said.

Scribe® puts math in your documents

Why cut and paste to insert mathematical equations and symbols in your documents? The Scribe Document Production System software intermixes text, graphics, special characters, and mathematical equations in all types of printed output. Output such as manuals, proposals, textbooks, and technical publications. Scribe lets you include complex mathematical expressions that look professionally typeset. And wait till you see how easy it is.

Scribe is available for DEC, Prime, IBM, Sun, Apollo, and most UNIX systems. Your output can be printed on a spectrum of devices from letter-quality typewriters to photocomposers and laser printers.

Scribe makes producing mathematical output as easy as π. To get started contact Wayne McDaniel.

UNILOGIC, Ltd.
160 North Craig Street
Pittsburgh, PA 15213
412-621-2277

UNILOGIC

ARMY from page 1

networks.

Personal computers, terminals and printers are linked to each other and to individual hosts through a Sytek, Inc. Local Net broadband local-area network. The hosts are connected to each other through a 5M bit/sec Ungermann-Bass, Inc. Net One local-area network.

Lanpher noted that the Army saved $300,000 on the 450-terminal prototype by having its own personnel run the cabling last year.

"The majority of the work was in developing software for the interfaces," he added. The networking software, including a virtual circuit handler for each terminal, and the networking configuration were developed by the Johns Hopkins University Applied Physics Laboratories. But little of the other equipment and software was customized.

Throw out baby with bathwater

"We are using off-the-shelf products wherever possible and are retaining our installed base wherever possible. The last thing we want to do is throw out the baby with the bathwater by developing a system that requires all new equipment. We had the basic concept, and we said we wanted to use standard, off-the-shelf equipment and software," Lanpher noted.

He said the prototype concept with generic products is more flexible than the Army's traditional DP approach, where it would have contracted for a complete system based on expected needs, such as the tolerable number of packet collisions, speeds and capacities. He noted that the traditional approach would have meant several years of installing a complete network and then analyzing the functionality.

Analyses of the prototype — one of which is now being completed by Control Data Corp. — can be used to define more clearly the Army's functional needs, such as a payroll application, which may not be as clear-cut as those of a corporation, Lanpher said.

Hios sent 1,100 questionnaires to users in eight Army agencies. "We got back 700, with 400 of those saying they used Hios often. This whole process of evaluation is very complex, but we were very pleased to get such a good response to a questionnaire," Lanpher said.

"We not only asked the users which applications they were using but which ones they weren't using," he added. "What we know already is that we need to do a better job in getting them up and running. We are developing an application team — people who can go around and say to the user, 'OK, you know how to use it as a basic tool. Here is how you can use it to do your job better.' " Users cited some technical problems but said they would be highly satisfied with Hios if those bugs were removed, according to Lanpher.

Hios, which follows the International Standards Organization's Open System Interconnect model up to the Level 4 transport layer, could grow to 1,200 terminals if made permanent next year, but it also could lead to Army posts around the world setting up compatible office networks linked to each other through the Pentagon's Defense Data Network.

Lanpher said developers of Hios have consulted with U.S. Navy and Air Force systems developers in the hope of establishing interservice systems compatibility.

WHEN THE CHAIRMAN EXPLODES OVER A SECURITY LEAK, WHAT'S YOUR DEFENSE?

VMCENTER: THE ONE INDISPENSABLE SURVIVAL TOOL FOR VM DATA CENTER MANAGERS.

It doesn't matter who actually leaked it—if there's a failure in system security, it's *your* problem.

But now, at last, you have an ally. In VMCENTER.

VMCENTER puts you squarely in control of system resources—providing multiple levels of authorization, for maximum protection against security violations.

It also allows you to do a lot more. Change passwords in a flash, encrypt data through simple commands, and keep top management informed of potential problems through a variety of reports.

Best of all, VMCENTER makes *you* secure—knowing that problems are being taken care of *before* they happen, not after.

But there's more.

In addition to security problems, VMCENTER solves a lot of others, like disk and tape management, resource scheduling and accounting, even workload balancing. And it does it all in an integrated manner that's more effective than any possible collection ofquick fixes.

VMCENTER. It's a survival tool—and then some. Once you use it, you'll wonder how you ever got along without it.

And the Chairman may even learn to feel the same way about you.

For more information on VMCENTER, call or write VM Software, Inc., 2070 Chain Bridge Road, Suite 355, Vienna, Virginia 22180, telephone (703) 821-6886.

VM SOFTWARE, INC.

ISN from page 1

network across its campus, according to Paul Stieman, director of the university computer center.

When completed next September, the ISN will include eight nodes and 29 concentrators, providing host support for roughly 450 remote asynchronous terminals and personal computers. End-user devices will be attached to the network through RS-232C interfaces using copper twisted-pair wire. Network components will be interconnected through a fiber-optic backbone network the university is installing (see related story above) and T1 microwave facilities.

The basic design objective, according to Don Salvin, data communications supervisor at the university, is to provide the school's terminals with increased connectivity to their host processors while reducing the complexity of the network configuration. The university has two triprocessor Digital Equipment Corp. Decsystem-10s, a uniprocessor Decsystem-10, two DEC VAX-11/780s, a VAX-11/785 and a National Advanced Systems Corp. (NAS) 8050.

Terminals in five centers

To complicate matters, the terminals on campus — most of which are located in five centers but some of which are scattered over the campus — are six miles away from the university's computer center. These locations are connected with a 12-GHz Sanbar CE-1130 microwave radio system that provides a T1 digital link operating at 1.54M bit/sec.

Today, the T1 radio capacity is divided into multiple channels with General Datacomm Industries, Inc. Megamux multiplexers. These channels are used to connect communications processors and multiplexers at the computer center with complementary processors and multiplexers on campus.

The university's two academic Decsystem-10s, for example, share a DEC PDP-11/50 set up as a front-end processor, which, through the T1 link, supports four remote PDP-11/34s to which terminals are attached. The school's three academic VAX systems, on the other hand, are multiplexed through a Rixon, Inc. DCX 850 statistical multiplexer to three remote Rixon systems that provide terminal interfaces.

The administrative Decsystem-10 is configured like its counterparts — with a PDP-11/50 front end supporting terminals through two remote PDP-11/34s — but the administrative NAS 8050 is unique. This IBM-compatible mainframe sits behind an NCR Corp. Comten 3690 communications processor that supports, through bridges and the T1 radio, a remote Ungermann-Bass, Inc. Net/One local net.

The front-end Comten is loaded with protocol conversion software enabling the use of asynchronous terminals with the NAS. Because the Net/One has a gateway to a local PDP-11/34 — as well as a direct connection to the NAS — users on campus can use the same terminal to access either administrative system.

Initially, the Net/One was installed as a test system with the idea that it might be used throughout the campus. Salvin said those plans were abandoned in favor of the AT&T system because the ISN "is more functionally capable than Net/One." While initially satisfied with the local net, Salvin reported that at higher speeds he was losing connections from board lockouts. He also noted that resetting communications parameters for a single terminal required taking down an entire board, which disrupted other users.

Those problems have not arisen with the AT&T ISN. The single-node ISN was installed in September in one day, cut over within three days and has not since experienced any hardware or software failures, Salvin said.

This ISN node is presently being used as a terminal switch within the computer center to supplement the systems previously outlined. Eventually this site will be connected through three T1 microwave radio links to the campus, where roughly seven additional nodes will be placed. Campus nodes will be interconnected with the school's fiber-optic backbone network, which will also be used to link the nodes with roughly 29 concentrators. The concentrators can extend the reach and the number of devices supported by a single node.

See ISN page 11

HP 3000
Financial Software
COLLIER JACKSON, INC.
We bring software to life
813-872-9990
3707 West Cherry Street, Tampa, Florida 33607

SOFTWARE
QUEO-IV
PRIME USERS
Let our Clients tell you about our Software performances. QUEO adds additional strength and flexibility to your existing PR1ME System.
If you are using PR1ME INFORMATION, COBOL, FORTRAN, "C" or MIDAS PLUS....We would like to talk to you. QUEO's Fast-Compatible Application Development, Data Base Managements Techniques and Report Writing will help you address all of your organization's commercial Data Processing requirements.
QUEO's THE ONE!
COMPUTER TECHNIQUES
709 NORTH STATE STREET
P.O. BOX 257
CLARKS SUMMIT, PA 18411-0257
(717)586-1030
"Entering Our Second Decade Of Commitment To The PRIME Community"!

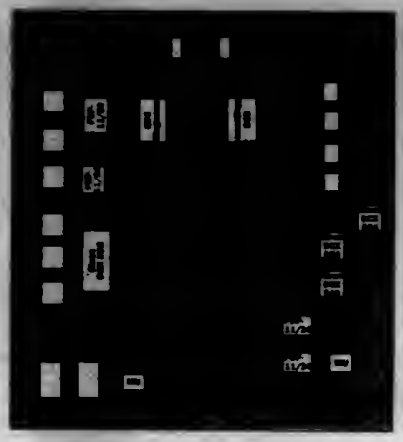
Completed AT&T ISN to tie campus systems

The University of Pittsburgh's computer systems, housed in a center in an office park six miles from the campus, are connected to the school by a 12-GHz 1.54M bit/sec microwave link. The diagram shows how the network is currently configured and how it will look when the complete AT&T Information Systems Network (ISN) is installed.

Today, the capacity of the microwave system between the two locations is divided into lower speed channels — from 19.2K to 56K bit/sec — using a General Datacomm Industries, Inc. (GDC) Megamux.

The Digital Equipment Corp. PDP-11/60, set up as a front end for the two uppermost academic Decsystem-10s, supports four remote PDP-11/34s that have multiple 1,200 bit/sec asynchronous ports. The other academic systems, the two DEC VAX-11/780s and the VAX-11/785, are connected to a Rixon, Inc. DCX 860 statistical multiplexer. The DCX 860, DCX 840 and DCX 836 on campus provide 2,400 bit/sec asychronous terminal support.

The administrative systems include the remaining Decsystem-10 — configured like the others — and a National Advanced Systems, Inc. (NAS) 8050. The 8050 sits behind an NCR Comten, Inc. 3690 communications processor loaded with protocol conversion software, enabling asynchronous terminals to be used on this IBM-compatible mainframe.



These terminals are supported on campus through bridges by an Ungermann-Bass, Inc. Net/One broadband local-area network. The Net/One is also connected to the VAX-11/34 serving the administrative Decsystem-10 through a network interface unit (NIU), meaning local net users can access either system.

Use of the ISN will enable the GDC and Rixon multiplexers, as well as the Net/One, to be turned out. Four of the six PDP-11s configured as front ends will be moved back to the computer center as these machines are retired. Instead of the single T1 facility currently used to connect the locations, the ISN will use three 1.54M bit/sec links.

When completed, the ISN will enable terminal users on campus to access any system to which they have clearance.

SAVE!
ON 3-D MAINFRAME SPREADSHEET
was $16,500 and $13,200
OS/MVS · TSO CICS $7,500
DOS/CICS $5,000
Sale ends December 31, 1984
UNICALC CORPORATION
(215) 687-0455
Two Academy Lane
Wayne, PA 19087

ISN from page 10

As the ISN is being completed, the General Datacomm and Rixon multiplexers will be turned out, as will the Ungermann-Bass Net/One, and four of the five front-end PDP-11/34s will be brought back to the computer center.

This will simplify the entire network configuration and its management, according to Salvin.

For the near future, hosts will be hard-wired to the ISN, but Salvin said that they are considering writing a VMS driver to support a host interface that would reduce both the hardware and the number of wires needed to connect the machines.

The completed ISN will be functioning like a data switch, similar in manner to the way the Rixon DCXs are currently used, Salvin said. The advantage is that the ISN is more expandable and can support high-speed host-to-host file transfers, the supervisor noted. The maximum speed supported on a DCX trunk is 56K bit/sec, he said, whereas the ISN can interconnect machines at 8.64M bit/sec, the operational speed of the short bus in each node.

Costwise, Salvin said, the ISN is comparable to competitive devices. David A. Forejt, associate vice-president for computing and telecommunications, put the figure at $350 per port.

The major complaint Salvin has with ISN is that its software is "relatively primitive."

For example, in the initial release "there is no way of determining what sites are busy, [and] which aren't," he said. Software that would provide site usage data is expected to be included in the multinode release, which AT&T has promised will be available shortly to meet the university's plans.

SPRINT
SPOOL TO 328X
(Also 3262 and ASCII Printers)
VS1 and MVS
JES, JES2, and JES3
Local and Remote Printers
Control Printer Activity from ANY VTAM terminal using SPF-like Panels
Data Formatting Facility
BTAM and VTAM Support
Full FCB and UCS Support
No System Mods Required
Multiple Printers Run in a Single Address Space
Support For SCS Devices
SMF Accounting Records
Shares Printers With Other Applications
Worldwide Support
TONE Software Corp.
Free Trial
1735 S. Brookhurst, Anaheim, CA 92804
(714) 991-8400 Telex 181582

Factory nets to be topic of sessions

WALTHAM, Mass. — C. Kenneth Miller, president of Concord Data Systems, Inc., based here, will be the featured speaker on local-area networks for factories at the Yankee Group's annual briefing sessions, "New Technologies; New Solutions."

Miller will discuss his company's Token/Net local-area net in a session titled "Factory Networks in Chaos."

The Yankee Group sessions will be held Dec. 4-5 at the Plaza Hotel in New York and Dec. 11-12 at Rickey's Hyatt in Palo Alto, Calif.

The registration fee for the briefing sessions is $875.

Information is available from the Yankee Group, 89 Broad St., Boston, Mass. 02110.

BECOME A CICS CONSULTANT IN JUST TWO WEEKENDS.
We know that it's tough for consultants to fit a weekday course into their hectic schedules. That's why SysEd offers special CICS training courses for consultants that you can complete in only two weekends.
Our intensive weekend courses in Command Level, Macro-Level, Internals, Application Design and VSAM are designed to make even non-CICS programmers immediately productive in a CICS environment. Each SysEd course provides a true-to-life learning experience with "hands-on" use of the computer, up-to-date, practical information, a solid foundation in CICS fundamentals and insights into advanced materials, and individual attention from highly qualified instructors.
SysEd's special weekend courses for consultants are held regularly at our classroom/computer facilities in New York City, Chicago, San Francisco and Dallas. Because class size is limited, applications are on a first come, first served basis.
For more information, call David Shapiro (212) 889-3386
SYS-ED
35 West 35th St. off Fifth Ave. New York, NY 10001 212-594-0147

WASHINGTON UPDATE
Mitch Betts
CW Washington Bureau

Carnegie-Mellon site of DOD software center

WASHINGTON, D.C. — Carnegie-Mellon University in Pittsburgh recently won a high-stakes competition among universities vying to be the site of the Department of Defense Software Engineering Institute, which will develop and promote techniques for automated software production [CW, Sept. 24].

The Pentagon's selection of Carnegie-Mellon for the five-year, $103-million contract followed an intense lobbying campaign by the bidding universities and their political representatives. The bidders hoped the institute would attract high-technology industries to their locales.

The Pentagon said the institute will study automated software development tools that will help military software vendors lower their costs. Also, the institute is likely to develop interface specifications for advanced communications networks that permit assembly of reusable code modules developed at dispersed locations and develop criteria for the evaluation and validation of programming environments.

Board rules against bias in airline reservations

WASHINGTON, D.C. — The Civil Aeronautics Board (CAB), continuing its assault on bias in computerized airline reservation systems, recently ruled that the systems must be able to display up to nine connect points, or "hubs," for connecting flights.

The CAB said it acted because an airline-owned computer reservation system can limit the display seen by travel agents to the hub airports favored by that airline.

The final rule, effective Nov. 14, was opposed by Delta Airlines. Delta said that expanding the capacity of its Datas II system from five to nine points would require expensive hardware and software changes, because the system features on-line construction of connecting flights, rather than prestored connecting flights.

The CAB acknowledged that its rule may have a "chilling effect" on the innovative system, but said the rule was needed because of the anti-consumer and anticompetitive effects of the systems.

Board member Barbara E. McConnell dissented, calling the rule premature, arbitrary and burdensome for the airlines.

Panel urges government to raise research budgets

WASHINGTON, D.C. — A high-level science panel is urging the federal government to increase research budgets for supercomputers and educational hardware and software.

The National Academy of Sciences' Committee on Science, Engineering and Public Policy made the recommendations to both the White House Office of Science and Technology and the National Science Foundation, according to a recent announcement.

Supercomputers are critical to technological leadership in a range of applications from aircraft design to basic chemistry, the panel said. Specific recommendations included the following: continued support for development of parallel processing, appropriate software and new programming language concepts; strong support for artificial intelligence and efforts to speed the transfer of supercomputer research results into commercial production; and teaching U.S. specialists to read Japanese technical literature.

In addition, the committee said additional research is needed, particularly in artificial intelligence, to develop "integrated [computer] systems capable of interacting intelligently and sensitively with students."

FCC approves protocol service

WASHINGTON, D.C. — The Federal Communications Commission last week granted the divested Bell operating companies permission to perform X.25 and X.75 protocol conversions for asynchronous terminals as part of their tariffed local service functions.

The FCC said the divested Bell operating companies would not have to offer protocol conversion — considered an enhanced service — through a separate subsidiary, which current FCC rules require for services not considered basic. The carriers argued that it was "not economically feasible" to establish a separate subsidiary when protocol conversions are priced out of reach for low-volume users.

FCC Chairman Mark Fowler commented after the action that the divested operating companies will be permitted to offer "more efficient" use of their local-area facilities with the protocol conversions and that "rigid interpretations of the rules" should not be used to prevent new service offerings.

The divested Bell operating companies seeking to offer protocol conversion are Northwest Bell, South Central Bell, New Jersey Bell, New England Bell, Southern Bell, Southwestern Bell and Pacific Northwest Bell telephone companies.

Dumb.

Stand-alone programs can't be made to work as a system no matter how hard you might try.

Stand-alone programs are fine. Unless, of course, you need them to work together. Because the sum of the parts will never equal a whole.

That's why even the highly touted WordStar,* dBase II™ and 1-2-3,™ programs don't make sense as a business system.

They were designed to perform very specific application functions only, and therefore, make miserable workmates.

Fortunately, there's a smart solution. It's the new Smart Software System.

Smart's unique "modular integration" is the key to productivity. It means that The Smart Word Processor, The Smart Data Manager

STC fails to deliver beta-test storage system

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — Financially troubled Storage Technology Corp. (see story, page 97) has repeatedly failed to deliver optical disk storage equipment sought by the U.S. Geological Survey (USGS), a large federal agency that is eager to beta test the equipment.

"We have been expecting the equipment for over a year, but it has never been shipped," Theodore M. Albert, chief of the USGS office of data administration, told *Computerworld* last week. He said that Storage Technology Corp. (STC) and USGS had a verbal agreement that STC's 7600 Optical Storage System would be shipped in October 1983 so that USGS could be a beta test site for the 4G-byte storage system.

Albert said USGS is "extremely interested" in the system because STC's 14-in. disks are the only affordable, high-density optical storage devices now on the market. "We need that kind of technology," he said, particularly for high-volume backup and archival storage.

Asked about the delay, Jack Scott, vice-president of STC's worldwide marketing, said, "We were behind schedule because there were a number of integration and design issues that had to be resolved. They are now being resolved."

Scott said STC is now shipping subsystems to customers for alpha tests and predicted the volume of shipments will increase in the second quarter of 1985.

For the USGS, Albert said delivery had been scheduled for September, was delayed to October, then December and now is tentatively scheduled for early spring. "Hell, I've got data sets sitting here. I've got people trained to do it. We still want to test the equipment, and we will do so if [STC] ever ships it," Albert said in a telephone interview from his office in Reston, Va.

"We've been looking at the technology for five years, kicking the tires, and we're pretty sure we want to go with it for our mass storage needs," he said. "The question is, can we get the technology in-house and start using it?"

Albert said the USGS is exploring optical disk technology for digital storage of scientific and engineering data — such as cartographic, geologic, hydrologic and Landsat satellite data — as well as for scientific and administrative records.

In addition, he said, USGS wants a digital image-scanning system for storage of the agency's massive files of maps, charts, graphs and other documents.

Smart.

The fully integrated Smart Software System is designed to make the whole office more productive.

and The Smart Spreadsheet with Graphics not only have the uncompromising power and capacity of these leading stand-alone programs, but they also have the unprecedented capability to work brilliantly together.

So you can easily transfer data and pass commands from one to another. Which means that you can compile financial data, to be included in graph-form, within the text of a printed report, that's mailed to a list drawn from the data manager — automatically.

Don't short change your business by attempting to squeeze the impossible out of a makeshift software system. Get Smart, and the whole office will thank you.

Smart is currently available for the IBM PC, PC/XT, PC/AT, and compatibles. For more information please call, 800-GET-SMART.

Smart Software
from Innovative Software

Cost, cancellations impair software quality

CW AT ENTERPRISE INFO SYSTEMS

By Kathleen Burton
CW West Coast Bureau

SAN DIEGO — Up to 25% of large software systems (those with over 64,000 lines of source code) currently under development will be canceled before they are completed, and up to 60% will experience significant cost and schedule overruns, according to T. Capers Jones III.

Jones, general manager of the Nolan Norton Co., painted a pessimistic picture of domestic software quality and programmer productivity at a seminar held recently at the Enterprise Information Systems Forum here. Jones said a recent study found that along with the cancellations and overruns, approximately 75% of the large systems under development will experience serious operational difficulties.

Today, the average large system software project runs more than a year behind schedule and costs almost twice as much as initially estimated, Jones said.

Factors slowing development

Armed with statistics gathered from his study of 200 major U.S.-based corporations, Jones said that several key factors caused the development slowdowns — variations in productivity related to program size, the complexity and originality of the program and changing program development models.

Program enhancements in a large program (250,000 lines of source code) usually require twice as much time and money to develop as first-time, stand-alone programs, Jones said, due to increasingly complex requirements for base code analysis, program recompilation and configuration control.

Jones' study showed that, on the average, it takes 48 to 60 months to develop a very large program (with over 512,000 lines of code), 15 to 36 months to develop a medium-size program (with up to 64,000 lines of code) and five to 15 months to develop a small program (up to 2,000 lines of code). To avoid significant cost and schedule overruns, he said, companies must use realistic development schedules based on these projections.

In very large programs, defects in coding, documentation and incorrect bug fixes result in an average of 300 serious errors per 1,000 lines of code, Jones said. To correct this, the development model is emphasizing longer design times, high-speed prototyping and a shorter debugging phase.

Another problem facing software developers is the rising cost of software maintenance, a cost that has skyrocketed to as much as 80% of the total development budget. IBM maintains over 30,000 application programs, he said, adding, "Maintaining 30,000 programs can get as expensive as maintaining a fleet of 30,000 Cadillacs." According to Jones' figures, a program with 250,000 lines of source code used by 1,000 international users will cost $79,000,000 to maintain over a five-year period.

Recent studies conducted internally by IBM, TRW, Inc. and Nippon Electric Co. of Japan showed that maintaining "error-prone modules" (those portions of programs with clustered errors) is the most expensive single task in the industry, Jones said. If error-prone modules of programs can be isolated and recoded, companies can realize considerable cost savings, Jones claimed, because only specific program areas need to be reworked.

Baseline software quality and productivity can be increased and maintenance costs reduced by as much as 75% by using structured code, program generators and high-level programming languages, Jones said. Another productivity enhancer catching on with U.S. and Japanese corporations is the development of standard libraries containing blueprints of reusable code. Code blueprints can lower development time by 80% and decrease program defects by over 20%.

PTC conference set for January

HONOLULU — Representatives from four Asian and Pacific nations will review the development of telecommunications in their countries at the Pacific Telecommunications Council's (PTC) eighth annual conference Jan. 13-16 at the Sheraton Waikiki here.

Case studies of Korea, Taiwan, New Caledonia and New Zealand will be presented during afternoon sessions of PTC '85. Y. K. Chen, director of telecommunications for the China, will review his country's move toward a digital environment. Registration fee is $395 per person.

More information is available from PTC at Suite 308, 1110 University Ave., Honolulu, Hawaii, 96826.

What we
is a failure to c

IBM policies said to push DP centralization

Analyst cites company's software fees as example of bias against distributed processing

By John Desmond
CW Staff

NEW YORK — While IBM appears to have taken a neutral stance on the issue of centralized vs. distributed information networks, the company continues to encourage users to adopt as much centralization as it can, according to consultant, author and lecturer Fred Lamond.

Speaking at a seminar on IBM strategy here recently, the specialist in analysis and evaluation of IBM cited the following IBM strategies that encourage centralization:

- Software license fee policy.
- The IBM Network Communications Control Facility (NCCF) and Operator Communications Control Facility (OCCF) programs.
- Instant data base updating.

IBM "fought for a long time against distributed processing," Lamond said, defining distributed processing as systems in which processing is shared between remote and central CPUs. (In contrast, in dispersed processing the remote CPUs have no communication with the host.) According to Lamond, since 1979 IBM has formally announced a more neutral position concerning centralizing networks.

Users who have multiple 4300 series CPUs as satellites, who may want to run an electronic mail program on each one, run up against IBM's policy on licensing.

IBM software licensing policy

The policy requires that a software license fee be paid for each CPU running a program, regardless of CPU size. A 4361 Model 3 processing 100 transactions per day will pay the same fee as a 3081 Model KX processing 10,000 transactions per day, Lamond said.

"The flat rate per CPU license fee encourages users to run programs on the smallest possible network of CPUs," Lamond said. He added that IBM usually raises its software license fees when it announces hardware price reductions. "The more you distribute program products, the more your software license costs will go up in relation to your hardware. This is an important tool IBM uses to encourage you to centralize," Lamond told his audience of DP professionals.

IBM's NCCF and OCCF programs encourage DP professionals to be physically located at the host site, "so that no systems programmers are required at a distributed site," Lamond said.

When systems programmers themselves become distributed, "mini DP departments" may rise and a loss of control could result, Lamond suggested.

With NCCF, any workstation becomes a control console, and the remote site needs only an operator. The OCCF preserves a system dump of a program stopped by a programming bug on disk at the remote site, instead of printing it out. The dump pages are forwarded one at a time to the host.

Lamond said that in IBM's image of a typical computer network in the mid- and late 1980s, the host mainframe runs MVS, and data is archived to magnetic tape only from the host. "All DP professionals are at the corporate host site, responsible for all data archiving and for upkeep of the corporate data base," Lamond said.

The local satellites are equipped only with disk drives — no tape drives — and the data on disk must be moved upstream to the host for updating.

'IBM pushing a bit too far'

Although Lamond said he likes the system, there is one aspect that he said "IBM is pushing a bit too far."

That aspect is requiring updating of the corporate data base simultaneously with transactions at the remote sites, which is a communications expense as well as a processing demand. "You may have applications where you need that instant, on-line communications, but for most users, the corporate data base as a backup for the local [data base] is a good idea," Lamond said.

"I do not believe the corporate data base always has to be brought up simultaneously." Once or twice a day would be adequate, he added, noting that with such a practice, "You will probably be able to do with a much lighter host."

have here
communicate.

Word processors can't always communicate with other word processors.

Internal mail networks can't often communicate with other outside networks.

Apples can't communicate with oranges.

People can't always communicate with people.

The advanced technology that was designed to enhance communication is sometimes leaving its users wondering if it might be better to go back to the Pony Express and carrier pigeons.

The answer? The QUIK-COMM™ System, a global electronic mailbox service.

QUIK-COMM is a worldwide communications integration system. So you can make your business information as multi-national as you are.

It's the largest, most advanced and comprehensive worldwide business communication system, with a continually expanding array of enhancements. And the system allows utilization of your existing equipment.

No other system can match what we offer in network, application capability and worldwide coverage. And no other system has the name General Electric on it. Which says a good deal about things like quality, reliability, service support and commitment.

We'll work together to define your needs, and develop the best solution for you. Call 800-638-9636, ext. 2001 or contact us by electronic mail.*

GE Information Services Company CW-11/26-0
Manager of Client Services, 401 North Washington Street
Rockville, Maryland 20850
Name_____ Title_____
Company_____
Street_____
City_____ State_____ Zip_____
Tel. no._____ Telex_____

INFORMATION SERVICES

General Electric Information Services Company, U.S.A.

*The one-way ASCII terminal, in the U.S. call 800-638-9636. Listen for the computer tone and insert the telephone into the coupler. Press the "E" key-second down, then the carriage return key. The system will then request that you enter a user number. Enter MYMAIL MAIL. The system will then prompt you.

MANAGEMENT INFORMATION CAPABILITY
for THE IBM S/38
For more information
Contact Charles White at:
michaels, ross & cole, ltd.
P.O. Box 4533
Oak Brook, IL 60521
(312) 986-0116

Nursery's ordering system cuts wilted sales

By Paul Gillin
CW Staff

SAN DIEGO — Order processing and billing at Santa Ana, Calif.-based Hines Wholesale Nurseries are a little different from most wholesale businesses. If Hines misses a shipment by even a few days, it could mean canceling the whole order or even scrapping the product.

That is because Hines deals in an especially fragile product — ornamental plants. Its 420-acre Santa Ana nursery grows 20 million plants annually, 800 varieties in all. That makes Hines one of the top three producers of container-grown plants in the country. The company also operates nurseries in Houston and Vacaville, Calif.

To process orders in 24 hours or less, Hines uses an IBM System/38 with 4M bytes of main memory and a line of integrated financial software from Professional Computer Resources (PCR) of Oak Brook, Ill. The two sister nurseries, located in Houston and in Bacaville, Calif., and the Hines sales staff are kept on-line to the Santa Ana nursery through four dedicated communications lines, according to Jim Wapelhorst, director of management information systems. Wapelhorst was interviewed at PCR's Fall User Conference, held here recently.

The perishable nature of Hines' products makes on-line processing a necessity, Wapelhorst said. The company's 30 sales representatives use Applied Digital Data Systems, Inc. Viewpoint portable terminals to enter orders from around the country. Sales representatives can also log on to the System/38 to check the status of nearly any order at any time.

CW photo by P. Gillin

Wapelhorst

When an order is entered into the system, it passes through a credit check and is either put on hold or cleared for shipment. The order pops up on the shipping managers' screens at any combination of the three locations that will fill the requirement. The manager decides in which truckload the order will be shipped and enters that number into the computer.

The software then calculates the size, weight and shipping charges of the load and also factors in extra charges like boxing costs. It also assigns a dock number where the plants should be loaded.

Picking labels then come off the printer, detailing the pertinent information for loading. The picking orders are sorted by variety of plant so that tractors can bring back fuller loads and spend less time traversing the fields to pick up bits and pieces of an order, Wapelhorst explained.

A quality assurance (QA) inspector has a last chance to modify the order prior to shipment. "Because we're dealing with perishable products, customers may want only a bud or a bloom on a plant," Wapelhorst said. "QA people can modify the orders and include explanations why a product wasn't shipped. When the shipper is just about to send out a truck, he hits a button and prints out a bill of lading for that shipment."

Hines plans to install PCR's manufacturing software next year, Wapelhorst said. "The whole idea is to know what our costs are and to have the plants in stock the shortest period of time after [they are] ready for sale," he said. "Unlike a lot of operations, when our inventory is on the shelf, we have to water it, prune it and take care of it."

Productivity meet slated

TUCSON, Ariz. — The Sixth Annual Conference on EDP Performance Management, sponsored by Applied Computer Research, Inc., will be held at the Doubletree Inn here March 11-15.

The conference will focus on the productivity of human and machine resources in serving user needs, with primary attention to managerial aspects. Specific topic areas will include the integration of business and data processing planning, capacity management, peformance management, human factors, costing and pricing and communicating with management. A one-day tutorial on "Improving the Data Center Function" will be held Monday, March 11.

Prices for the conference are as follows: for the one-day tutorial held March 11, $100 for either subscribers or nonsubscribers to Applied Computer Research publications; for the entire conference, March 11-15, $500 for subscribers, $575 for nonsubscribers; and for both the tutorial and the conference, $575 for subscribers and $650 for nonsubscribers.

More information is available from Applied Computer Research, P.O. Box 9280, Phoenix, Ariz. 85068.

1200 Multiple CPU Users redefine the word:

S.I.S.S.Y

Softfair '84 recruiters emphasize experience

Companies seek senior software, scientific engineers, communications managers

By Maura McKenney
CW Staff

WALTHAM, Mass. — Senior software engineers, communications managers, scientific engineers and program analysts were all in demand at Softfair '84, a job fair held here recently for software professionals.

For the 50 companies exhibiting at the job fair, employment needs ran the gamut, but for those without prior experience, one factor was evident: Entry-level job seekers need not apply.

At the well-attended Digital Equipment Corp. booth, signs calling for telecommunications professionals, software engineers and MIS professionals decorated the exhibit. In the center of the display was a sign reading "no entry-level positions."

"We do our entry-level recruiting on college campuses," said Bill O'Connor, manager of technical support.

At the Foxboro Co.'s booth, staffing specialist Fred DeGizzo said his company, a manufacturer of process management and control systems, had 30 technical positions available. The company was looking for software specialists in AT&T's Unix, C, Pascal, applications software, communications software as well as graphics and diagnostics. The average salary offered for these slots is $30,000 to $40,000, he said.

Range of visitors

Visitors to Softfair ranged from programmers who wanted to switch concentrations to technicians curious about current employment opportunities. Because of the sensitivity involved with job hunting, *Computerworld* agreed to use only the first names of the attendees.

Larry is a project manager with four years of experience at one company. After a career switch, Larry believes he entered his current position "at too low a salary. . . . It's been a good learning experience, but I have to make up for some salary," he said. As a project manager, Larry is looking for $50,000 a year. "I don't know if I'll get it; if I don't, I'll be happy where I am."

Shirley is a Cobol program analyst and a software consultant with three years' experience in Cobol programming. She said she is looking to spend less time in front of a computer terminal dealing with accounting problems. She said she was at the fair exploring opportunities in marketing support or technical writing. But she found her reception somewhat cool. "[The exhibiting companies] are hoping Mr. or Ms. Right will walk through the door knowing everything about Cobol, C, Unix and CICS . . . and be a living doll," she said. Shirley is now making $28,000 a year. "If I can match it and get into a situation I like, that will be even more important to me."

With four years of experience in Cobol programming for business applications, Chris is looking to switch her concentration. "The market is changing, it's going away from mainframes and into micros," she said. "I'm interested in a job where I can keep up with what's happening." Chris now makes $28,000 a year, but said that if she switches jobs, she would be looking for $32,000. But, she said, "Money is not a major consideration."

S.I.S.S.Y (sis'ē) *n.* **A smart data processing professional who has used Single Image Software™ to solve multiple-CPU related problems.**

Whether your company has ten mainframes or just brought in its second computer, a multi-processor configuration that shares DASD complicates your operation. S.I.S. is the high performance family of Single Image Software products that makes things simple again for everyone, from technical staff to operations people, right through to end users.

Transparently, S.I.S. products work across all systems to safeguard data integrity, speed up the accurate flow of information and dramatically streamline operations. S.I.S. helps bring your multi-system complex up to peak performance while saving time, money and valuable on-staff talent.

SUPER
M S I

Multiple-CPU's let you distribute workload between systems. Sharing DASD moves the jobs even faster. But what about the bottlenecks and job back-ups when hardware RESERVEs lock out entire devices? What are you doing to protect files from being clobbered when two users inadvertently modify the same dataset simultaneously?

If you're a S.I.S.S.Y, you give the problem to Super-MSI,™ the Single Image Software Multiple Systems Integrity facility. Super-MSI eliminates RESERVE lockouts and insures data integrity in a shared DASD environment. With no complicated job scheduling, elaborate control schemes or extensive software changes, Super-MSI guarantees your data integrity and eliminates your problems.

M S M

Do you want to save your operators from the tedious and error-prone chore of manual tape monitoring? Prevent tape overwrites? Relieve your budget of duplicate hardware costs and your systems staff of job reruns?

As every S.I.S.S.Y knows, you solve the problems of sharing devices in your multi-system complex with MSM.®

MSM, the Single Image Software Multiple-Systems Manager, automatically manages the allocation of shared tape and mountable disk drives across all systems in your complex. With MSM, your operating system controls which system can use which tape drive right now so your operators can concentrate on more productive tasks.

G C D

In a multi-system environment, monitoring systems can become a real run-around with an operator going from console to console reading messages, issuing commands, and responding to replies.

GCD,® the Global Console Director, is another valuable and powerful S.I.S. aid that routes all system messages through one console, taking streams of console messages and blending them into one. GCD allows each individual console in your complex access to and information from all systems in the complex, saving operator time, reducing hardware costs and improving operations. As a S.I.S.S.Y, you may find your hardware savings exceeding the cost of Single Image Software!

Single Image Software gives shared DASD users multiple CPU power with the operational simplicity of a single unit system.

It's no wonder more and more shared DASD users worldwide are proud they've turned S.I.S.S.Y. It's why you should, too. For more information on Single Image Software, call 800-237-2057. (In Florida, call (813) 263-5011.) Or be a S.I.S.S.Y free by just calling today for a 30-day trial of Single Image Software in your data center.

I'm sold on S.I.S.

cga
Software Products Group
960 Holmdel Road, Holmdel, NJ 07733

OIR publishes summary of '82 users meeting

WALTHAM, Mass. — The Organization for Industrial Research (OIR) is making available the summary of the 1982 OIR Users' Meeting, documenting the experiences of users of group technology, classification and coding and computer-assisted process planning.

"The 1982 OIR Users' Meeting Summary" contains case histories documenting the application of OIR's computer-aided design and manufacturing and group technology manufacturing software products.

Articles cover topics such as implementation procedures, benefits, human factors, hardware requirements, time standards, computer-aided process planning and computer graphics.

OIR currently publishes four software packages for the manufacturing industry. They are Multigroup, for group technology analysis; Multicap, a computer-aided process planning package; Multitreeve, a design retrieval system; and Multiclass, a classification and coding package.

The book costs $30.

More information is available from OIR, which is located at 240 Bear Hill Road, Waltham, Mass. 02154.

High-tech firms hire pros, lower costs at job fair

By Maura McInerney
CW Staff

WALTHAM, Mass. — At a function center adjacent to this state's self-proclaimed "Technology Highway," Route 128, local companies gathered with aspirations of hiring the best and the brightest of the area's software professionals.

Inside, specialists clad in business suits and bearing resumes drifted down aisles of booths boldly displaying company logos and in-house brochures. When they stopped to look, smiling personnel would extend a hand and begin their pitches.

This was Softfair '84, a two-night exhibition of corporations in the market for trained technological help.

Aids market exposure

Job fairs like this one are becoming increasingly popular, both among corporations looking to reduce hiring costs and professionals seeking exposure in the job market, according to David Callahan, manager of Software Career Link, sponsor of Softfair.

That popularity is evident in the number and names of participants. This year, Software Career Link sponsored seven job fairs in the Boston area. Next year, the company is taking its show on the road, planning 42 fairs for 13 cities, including Atlanta, Chicago, Dallas and Anaheim, Calif.

More than 1,000 attendees

At this month's fair, more than 50 companies paid about $2,700 a piece for booths at Softfair, which was attended by about 1,050 professionals. This year's roster included some heavy high-tech hitters, such as Adage, Inc., Cincom Systems, Inc., Cullinet Software, Inc., Digital Equipment Corp., Hewlett-Packard Co. and McCormack & Dodge Corp. For many firms, it was a new experience.

Softfair and other similar job fairs are "a godsend" according to Frank Emro, senior technical recruiter at Cullinet. The average cost of hiring a professional can range between $4,000 and $10,000 or more if an employment agency is used, Emro said. "If you take out a full-page ad in the *Boston Globe*, that cost can be $18,000 to $20,000, and you spend a week going through resumes." According to Emro, "Job fairs are a very inexpensive way to talk to a large number of very qualified candidates."

Reduces hiring costs

Hiring is almost continuous at Cullinet, which nearly doubled its work force over the past 16 months, Emro said. In addition, the company expects to hire another 700 workers over the next year and a half, he said. The company hires an average of between seven to 10 people as a result of each fair, which significantly reduces the cost per newly hired employee to about $100 per person, according to Emro.

For DEC, job fairs give department managers the opportunity to meet applicants face to face and immediately begin assessing the needs of the prospective employees, according to David Bausch, personnel recruiter at the DEC office in Merrimac, N.H. "If you can hire one person from the show, it's worth it," he said.

Although she is not convinced that it is the only way to hire qualified candidates, Robin Schwartz, group personnel manager at McCormack & Dodge, agrees with her colleagues. This year, the software company participated in about 10 job fairs, including five Softfairs, Schwartz said.

At each fair, the company expected to hire three or four candidates (about the average, according to Softfair's Callahan), bringing down the cost of hiring to about $500 per person, she said.

In addition to computer-related companies, general industry is beginning to be a big participant in the Softfairs, Callahan said. This year, Stop and Shop supermarkets, John Hancock Insurance Co. and retail store chain Zayre Corp. were among exhibitors. "Because these firms employ sophisticated computer systems, they are joining the high-tech crowd," he said.

DEC→TO IBM/SNA

Full SNA capability for your DEC computer! Comboard™/SNA gives your terminals access to IBM interactive applications. Data can be transferred between systems, all in the complete *fully supported package*. Comboard/SNA from Software Results.

Proven and reliable. Comboard/SNA is a single-board 256kb communications computer that plugs into your DEC Unibus. Teamed with Comboard software the system is a *cost-effective* solution to troublesome SNA communications problems.

Your DEC emulates an IBM PU Type 2 communication node. You have a *full gateway into your SNA* without passing through a secondary network.

For further information call or write Software Results... the leader in DEC to IBM communications.

COMBOARD.

Communications Boards from
SOFTWARE RESULTS CORPORATION
Call Toll-Free
1-800-SRC-DATA
[illegible]
In Ohio and outside, 1-614-[illegible]
[illegible] SILVER DRIVE • COLUMBUS, OHIO 43[illegible] • TELEX 4[illegible] SRC DATA CI
European Subsidiary
SRC Communication GmbH Eschborner Str. 6 D-6000 Dreieichhain 30, FRG
Telephone (6[illegible]) 6-[illegible] Telex [illegible]
SEE US AT...
DEXPO™-WEST 84, Anaheim, CA, December 12-15, Booth #711
UNIFORUM,™ Dallas Intercept, Jan. 22-25, 1985, Booth #1205.

Is Your Payroll Tax System Hogging Your Time?

Chances are your payroll taxing software is hogging unnecessary amounts of time, money and resources. BSI-TAX can change all that.

You can save because BSI-TAX is the most extensive software for payroll taxing ever developed.

- Easily updated by non-DPers
- Not compiled for tax changes in five years
- 400+ consecutive tax updates supplied without an error
- Available in COBOL and RPG III for minis and mainframes

Put payroll tax changes in the payroll department. Get rid of the payroll tax hog. With BSI-TAX you save time, money and resources.

BSI
Business Software, Inc.
3967 Peachtree Rd /Suite 107
Atlanta, GA 30340
(404) 449-3200

ATTENTION:
MVS Developers

Established NYC software company with a customer base in excess of 1,000 users, seeks a limited number of new products to add to our existing line of in-house and outside developed products.

WE OFFER:

- *The chance to have your product evaluated at over 20 new sites every week*
- *Corporate sales agreements with many of the Fortune 500*
- *Experienced first level technical support for your product*
- *Complete marketing support from large and knowledgable sales force*

We seek new and/or established products.

P.S. We have helped more creative Developers gain their independence than any other company. Please call us on (212) 206-7660.

The pc software to use if you have IDMS/R.

At last count, there were more than 50 integrated personal computer software packages.

But for companies with IDMS/R, we'd like to suggest that only one really makes sense.

GOLDENGATE™, Cullinet's pc software package, integrates seven components: database, spreadsheet, graphics, document processing, 3270 terminal emulation, asynchronous communication, and information manager. While the software is exceptional on a standalone basis, it offers an added benefit to pc users in an IDMS/R environment—true micro-to-mainframe integration.

Through the Information Database (IDB), the Cullinet software product that serves as a foundation for corporate information management, a GOLDENGATE user can have direct "transparent" access to all data stored in the IDMS/R database. Indeed, with GOLDENGATE, accessing corporate data is indistinguishable from accessing data on a diskette.

The Complete Software Solution

To find out more about GOLDENGATE, IDB and other components of our complete approach to information management, attend a Cullinet Seminar. To make arrangements, phone, toll-free, 1-800-551-4555.

The pc software to use if you don't have IDMS/R.

How does GOLDENGATE™ stack up against the more than 50 competitive integrated pc software packages on the market today?

With all due respect to those other packages, we'd like to suggest that it stacks up best.

GOLDENGATE's superior functionality results from its unique architecture. Each function in the program is designed to provide an optimum working environment. And each is linked to the others through core software.

The result is a functionally rich integrated pc package for business professionals. GOLDENGATE integrates spreadsheet, database, word processing, graphics and telecommunications capabilities. For use with databases other than IDMS/R, GOLDENGATE has a unique capability in combination with a standalone version of the Information Database (IDB) from Cullinet, a remarkable ability to effect effortless micro-to-mainframe integration. Integration so direct and transparent it allows the user immediate access to corporate data as needed.

GOLDENGATE, the integrated software that works better, because each of its components work better.

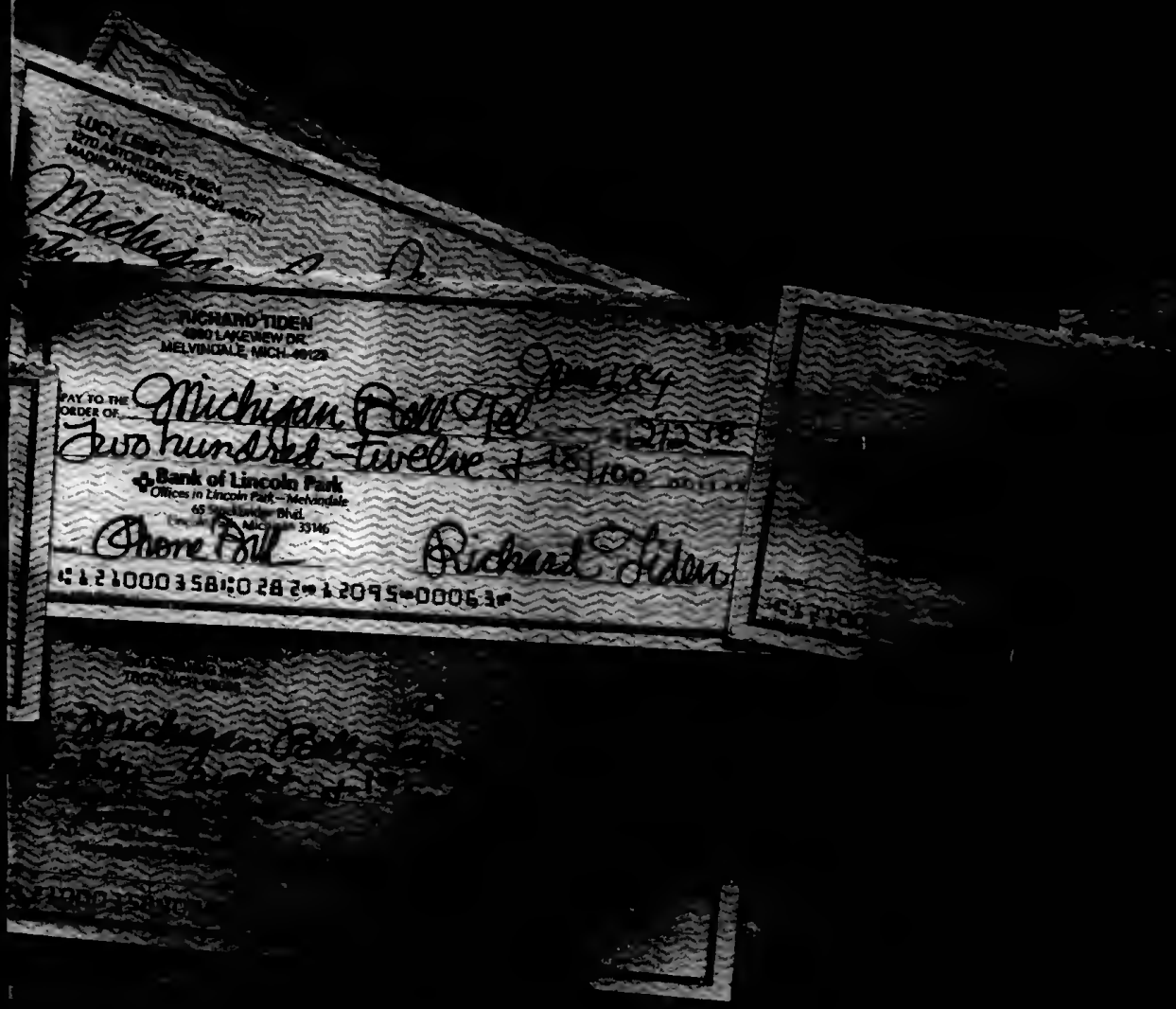
To find out more, we encourage you to attend a Cullinet Seminar. To make arrangements, phone, toll-free, 1-800-551-4555.

Cullinet

We understand business better than any software company in business.

© 1984 Cullinet Software, Inc., Westwood, MA 02090-2198
GOLDENGATE is a trademark of Cullinet Software, Inc.

How Michigan Bell saves $4.5 million from uncollectable accounts


RICHARD TIDEN
4980 LAKEVIEW DR.
MELVINDALE, MICH. 48122
PAY TO THE ORDER OF
Michigan Bell Tel
Two hundred twelve + 18/100
Bank of Lincoln Park
Offices in Lincoln Park—Melvindale
Phone Bill
Richard Tiden

Strategic planning vital to computer security

By John Gallant
CW Staff

ROSEMONT, Ill. — Q. How do you eat an elephant?

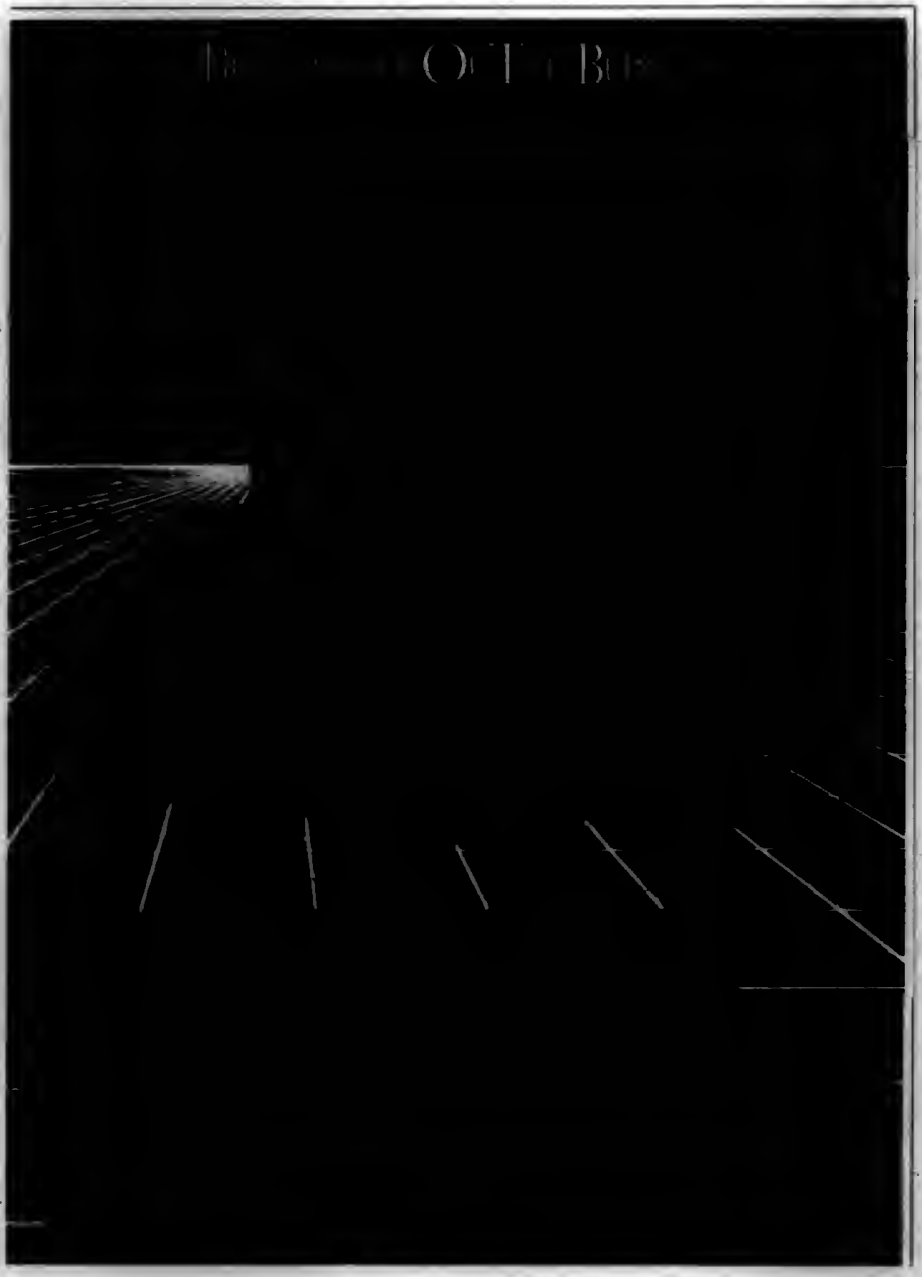
A. One bite at a time.

According to Martin Silverman, a partner in the Management Consulting Services Division of the accounting firm of Coopers & Lybrand, that riddle holds in it the key to successfully securing an organization's computer systems. Silverman, who spoke last week at the 11th Annual Computer Security Conference here, told attendees that quick fixes and easy solutions to security were not the answer. Security must be approached one bite — or step — at a time. And planning, especially strategic planning, should be relied upon as a guide.

"[GTE Telenet Communications Corp.] and other public networks have been unfairly accused of providing illegal access to supposedly secure systems," Silverman said. "But we cannot assign blame to Telenet and the others. Like Shakespeare said, the fault lies with ourselves. Examples of lousy security and poor planning abound. Strategic planning is the missing link in security today."

One characteristic of such poor planning, Silverman said, is that security has historically been considered a burden for users; security is often traded for so-called user friendliness. He said security has been a nonconcern for management, who either did not understand or care about its importance. In addition, security has been handled as merely a procedural issue for DP auditors who performed some perfunctory security checking, and it has been little more than an after-thought for DP.

Those factors have led to security mechanisms that are superimposed on applications once the system is already designed, developed and implemented and that are limited by convenience because designers fear users simply will not put up with strict security. Once in place, Silverman said, those mechanisms are thwarted by practice and a basic lack of understanding.



What's more, Silverman said, the security problem is worsening. Minicomputers and microcomputers, in addition to mainframe-connected terminals, are proliferating, and user sensitivity to security concerns is dropping as desktop capabilities increase.

"Despite the publicity surrounding the hackers," Silverman said, "we are not gaining any ground, whatever their motives. The rats are getting smarter while the trap makers fall behind, and the owners cannot be bothered."

"At the same time," he continued, "we are being told that the effective utilization of corporate data through efficient information systems will improve profitability and provide a competitive advantage. We are told that data is a major asset that can give you an edge. We are not being told that inappropriate security can destroy such an edge, and that is the clearer reality."

Silverman described a Coopers & Lybrand study based on interviews with top-level managers in major U.S. corporations. According to the findings of that study, more than 50% of the senior managers queried said they believe their businesses and industries are mature or declining. Thus, marketing and increased productivity are seen as more important than new strategic directions.

The findings, according to Silverman, indicate that accurate data and its protection are vital to American business today.

"Information integrity, communication, manipulation and analysis outside the traditional DP shop are critical success factors in modern American business. Security is a key element in ensuring the first three, and the fourth is impossible without security. We simply must convince senior management that security is vital to the mission of business today," he said.

In order to do that, Silverman said, security coordinators must "shed their mechanic's overalls" and take a seat at the corporate planning table. Security personnel must act as catalysts, bringing functional groups within the organization together to work out security guidelines and projects. Organizations must adopt a new approach to MIS development — an approach in which security becomes a basic component of system design from the beginning. In addition, senior management must become more involved in security planning and must understand the vital nature of information integrity.

Silverman suggested that security coordinators begin by constructively stating the case for a strategic approach to security. That includes stating the facts about security without relying on "fear tactics" and outlining reasonable costs and goals. Security personnel should also include in the management presentation a first project plan — what he described as the first bite of the elephant. Finally, he urged coordinators to document objectives to provide landmarks against which future progress can be measured.

Standards key to small-scale systems security

By John Gallant
CW Staff

ROSEMONT, Ill. — Ironically, acquiring a small-scale computer system can make an end user acutely aware, often for the first time, of the security problems mainstream DP faces.

In a typical scenario, according to Evany Miller, an end user reads in a trade or business publication, such as *Computerworld*, about a revolutionary small-scale system recently made available that promises to solve a plethora of nagging problems.

Miller, a senior data security analyst with Rainier Bancorporation who spoke at last week's 11th Annual Computer Security Conference here, said the system offers the user an end to reliance on mainstream DP and spurs visions of increased productivity and capabilities. Thus, the small-scale system is brought in-house, and the user is off and running — sort of.

"But no one told the manager that there were some direct correlations between mainframe and microcomputer security," Miller said. "For example, the user has to pick a good password, and he or she has to see that there is no sharing of passwords among the users of the small-scale system. The manager is also faced with building in accountability, maybe even audit trails, to ensure data integrity. The user has to provide for physical device security and for the backup of data on diskettes, both on- and off-site.

"These were all DP responsibilities before," Miller continued. "Suddenly, they are all the managers' responsibilities."

Security coordinator's job

To prevent security chaos among the many users of small-scale systems within an organization, Miller said, it is imperative that security coordinators draft, maintain and communicate to end users specific, carefully established corporatewide policies, standards and guidelines. She said they should encompass everything, including the selection of hardware and software, the acquisition process, security responsibilities, information classification and physical security of small-scale systems. Miller defined small-scale systems as intelligent processing devices such as minicomputers, micros and office automation equipment.

"It is your responsibility as security professionals," Miller told the audience, "to provide insight to users on the protection, integrity and security of small-scale systems. They can be invaluable as tools for specific needs, but without orchestrated management, they can result in frustration and confusion."

According to Miller, such policies, standards and guidelines are essential to a proactive, rather than a reactive, approach to computer security. "Small-scale systems are with us to stay," she said. "But the random purchase and use of such systems may be setting your organization up for disaster. Good policies and procedures can make these tools the valuable assets they were intended to be."

Miller said policies and guidelines for selecting hardware and software offer such benefits as providing for compatibility of devices, potential price discounts for volume buying and improved positioning for working out maintenance agreements with vendors. Policies for acquisition can encompass guidelines for risk and cost/benefit analysis, provide control over requisition, approval and installation and encourage a complete inventory of all computing resources.

"Policies presuppose a corporate architecture for the future use of automation," Miller said. "They can serve as a means of communicating to people what their roles are in protecting company information."

As an example of a formalized set of policies, standards and guidelines, Miller exhibited Rainier Bancorporation's systems integrity policies. Rainier's documents include a description of the legal basis for computing security and controls, a statement of the company's data security policy, an in-depth summary of security responsibilities and information on data classification schemes and standards for the control of information and computing resources. Also included in Rainier's policies are standards for the physical security of systems.

Rent the new Teleo Video TS 1605 personal computer from USL Data Systems. Graphics-capable 14" CRT, parallel and serial ports, and two 320 K disk drives—all standard in an integrated package. Call us today for the office nearest you.

USL Data Systems
A US Leasing Company
US
USL Data Systems
2998 Campus Drive
San Mateo, CA 94403
800/227-6994
415/572-6800 (in California)

Nobody offers more.

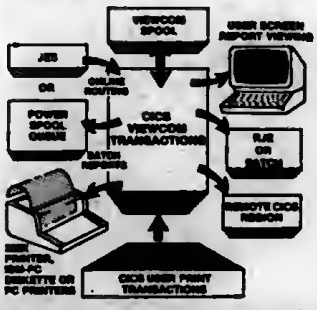
Lease the new GRID Compass Computer from USL Data Systems. True 16-bit processing and fully integrated software in a 10-pound package make the Compass the perfect combination of power and portability. Call us today for the office nearest you.

USL Data Systems
A US Leasing Company
US
USL Data Systems
2998 Campus Drive
San Mateo, CA 94403
800/227-6994
415/572-6800 (in California)

Nobody offers more.

VIEWCOM
JES SUPPORT PC'S & 328X
Automatic Batch Report Distribution System

- User Oriented Menus
- Automatic Report Segmenting
- No User Svc
- Report Routing
- Selective Page Printing
- SAVE $$$ in Paper & Delivery Cost



StarTech Software Systems Inc.
25-39 Borough Place, Woodside, NY 11377
(212) 204-2119 • Telex: 6871502

MicroFrame, Inc.
205 Livingston Avenue • New Brunswick NJ 08901 • (201) 828-4400

DEAR HACKERS:

You have caused much expense and damage. By the looks of things, you've only just begun. We at MicroFrame have developed a device to KEEP YOU OUT. It's called DATA LOCK & KEY. With a DATA KEY, access is effortless. Without a KEY it is impossible to 'HACK' your way into any type of system if it is protected by a DATA LOCK.

HACKERS CAN BE USEFUL

Our own computer is protected by a DATA LOCK. We invite you to dial in (201-828-7130). You will be answered by a 1200 BAUD MODEM. The data we gather from your efforts will help us to ensure that our DATA LOCK & KEY is the best protection available.

HELP IS AVAILABLE

For clues, just call our voice line (201) 828-4400 and ask for DATA SECURITY.

Thank you.

MicroFrame Inc.

Micro software TV ads play to mixed reviews

By Edward Warner
CW Staff

When Lotus Development Corp. ran a series of television commercials for its then-new Symphony integrated software during the 1984 Summer Olympics, the dealers were not the only ones beseiged by Symphony-hungry customers.

Ron Goldfarb's phone rang off the hook.

Goldfarb, manager of office automation systems for Pratt & Whitney Aircraft Group in Hartford, Conn., said he received dozens of calls after the series of ads aired, most of them from his firm's users of Lotus' 1-2-3 software.

Independent microcomputer support manager Karl May, meanwhile, said he found the magazine ads and television commercials from Apple Computer, Inc. sparked interest among the corporate users to which his firm, Complete Technology Corp., located in Elmhurst, Ill., provides micro support, peripherals and software.

Every available inch of advertising space, reportedly worth $3 million, in the November election issue of *Newsweek* magazine was devoted to Apple products.

Little or no impact

Other micro managers, however, have found the ads have had little or no impact on their users, and some, noticing greater brand awareness among users, attribute it not to advertising but to a continuing rise in user sophistication.

Surprisingly perhaps, several retailers also gave mixed reviews — at least on selling power — to the 1984 ad campaigns of firms such as Lotus, Ashton-Tate and Apple. The campaigns, which made heavy use of television, may have promoted name recognition for the firms but did little to improve product sales at the corporate level, said Tony Morris, whose New York-based Morris Decision Systems, Inc. sells micro hardware and software to corporate customers only.

Morris said he was in a "peeved mode, rather than an [enthusiastic] mode" because of the lack of success of any of the campaigns. Madison Avenue, he charged, has "hosed down" the personal computer industry, and "many of those moneys [spent on advertising] have been wasted."

Ralph Wagner, owner of Microsource Financial of Watertown, Mass., which retails hardware and software primarily to corporate accounts, said he, too, was not entirely pleased. The Apple ads, he said, were a success, but those for Symphony from Lotus "missed the mark not by a mile but by a light-year." Their biggest shortcoming, he claimed, was that they "did nothing for store traffic" and made no tie-in with Lotus dealers.

Uncertain of any impact

Many micro managers said they were uncertain that the ad blitz was having any impact on their users. While acknowledging that "I don't think you can watch an hour or so of prime-time television and not see commercials for hardware or software," said Gene Maiman, project manager for microcomputers at Columbia Pictures, Inc.'s New York office. "It's really hard to trace the original source of where the user got that product idea."

More and more users are coming to him asking for products by their brand names, but, Maiman said, this could be because users have become more sophisticated, an idea supported by Ron Jenks, director of information services at Touche Ross & Co., a New York accounting firm. Jenks said his firm's users were already knowledgeable about microcomputer hardware and software because micros have been in use there for between four and five years, and a personal computing newsletter has been circulating among the users for the past three years.

What may be the bigger concern for microcomputer managers, Pratt & Whitney's Goldfarb pointed out, is the question of what to tell the users when they ask for a product by name, only to find that it is not supported by the firm. This, he said, was exactly what happened when his phone was ringing off the hook with users who wanted Lotus' Symphony. Symphony, he said, had already been tested by his office and found to be too difficult to use. But what to say to the users who wanted to move up?

Goldfarb said he told them: "Trust me, guys, what you're using now is better."

Whether you want to rent, lease, or buy, we have the financing options to fit your needs. We also stock a broad inventory of products, so you can have exactly the equipment you need without waiting. And we back up every shipment with total product support, including maintenance and prompt follow-up on any problems or questions.

If this sounds like the kind of service you want, call us today for the office nearest you.

USL Data Systems
A US Leasing Company

USL Data Systems
2966 Campus Drive
San Mateo
CA 94403
800/227-6664
415/572-6600
(in California)

Nobody offers more.

LOW COST
CICS PRINTING

DTA/PRINT...new, economical CICS utility for viewing and printing POWER/VSE reports on CICS printers and terminals $2,400 (purchase).
Other software products: DTA/VSAM for VSAM backup and restore $1,200 (purchase)...DTA/DOC display operator console $600 (purchase).
Call 1-800-328-4827, Ext. 1365.

DTA Davis Thomas & Associates
Management Information Services
8800 Highway 7
Minneapolis, Minnesota 55426

DTA

Buy the Beehive ATL-004 ANSI standard smart terminal and get the perfect combination of price-performance and ergonomic design. The ATL-004 includes a low-profile keyboard and eight "soft function keys." A large 14" screen provides crisp reproduction and maximum viewer comfort. Call us today for the office nearest you.

USL Data Systems
A US Leasing Company

USL Data Systems
2966 Campus Drive
San Mateo, CA 94403
800/227-6664
415/572-6600 (in California)

Nobody offers more.

SUGI 10
A New Decade Begins

SAS Users Group International
Tenth Annual Conference
MGM Grand Hotel, Reno, Nevada

March 10-13, 1985

Co-Chairs: Michael P. Farrell, Oak Ridge National Laboratory
Rodney H. Strand, Science Applications, Inc.

Join 2500 SAS software users and learn more about the SAS® System for:

- Capacity planning and evaluation, and systems software
- Econometrics, time series, and operations research
- Education and consulting
- Graphics
- Information systems
- Interactive techniques
- Microcomputers
- Minicomputers
- Statistics

To register, contact: SUGI 10
SAS Institute Inc.
SAS Circle, Box 8000
Cary, NC 27511-8000
Telephone (919) 467-8000

SAS is the registered trademark of SAS Institute Inc., Cary, NC, USA.
Copyright © 1984 by SAS Institute Inc.

OUR WINDOWS OPEN A LOT OF DOORS.

Introducing the 5425 terminal from AT&T Teletype Corporation. It's the most highly featured ANSI 3.64-based terminal we've ever built.

Start with the 5425's windowing capability. Then add the fact that it's a general purpose editing terminal that's compatible with many computers such as VAX* and AT&T's new 3B series, and you'll see why it's such an outstanding value.

The nicest thing about the windowing feature is that it lets the operator take better advantage of multi-tasking capabilities of operating systems such as UNIX* System V.

As if that's not enough, the operator can do full-screen windowing without changing a program to fit the screen. At the same time, two more windows, which can overlap and vary in length and width, can be opened. The screen also can be divided into four independent windows which act as viewports into the terminal's 9600 character memory.

With 38 downloadable function keys and 16 screen labels, the 5425, which is also VT102* compatible, opens new levels for productivity. And the optional integrated intelligent modem features five programmable autodial keys to speed the dialing and logon functions. The modem also permits remote transmission from a standard phone jack.

If you want to open new doors in your career, look into our 5425. It'll make you look good. For more information, write AT&T Teletype Corporation, 5555 Touhy Ave., Dept. 3223-F, Skokie, IL 60077. Or call 1 800 323-1229, ext. 801.

*UNIX is a Trademark of Bell Telephone Laboratories, Inc. VT102 and VAX are Trademarks of Digital Equipment Corporation.

TELETYPE: VALUE SETS US APART.

AT&T
Teletype Corporation

"Teletype" is a registered trademark and service mark of AT&T Teletype Corporation. ©1984, AT&T Teletype Corporation

DunsPlus: The Micro Solution That Reflects The Way You Do Business

You've heard the buzzwords: user friendly, integrated, smarter, faster, cheaper. But when you push the rhetoric aside you're still asking the same question, "Why can't I get a system that solves more problems than it creates?"

You can. It's called DunsPlus and it's built to respond to your information-related business demands without creating demands of its own.

DunsPlus gives the IBM PC XT a built-in business environment. This lets you mold DunsPlus to fit the way you do business.

Within the DunsPlus environment is a software base of the best. Lotus, MultiMate, Western Union electronic mail (to name but a few), are all ready for immediate use. But additional programs to solve your unique problems can also be added with ease.

Instant, yet controlled, access to your choice of mainframes and subscription databases is also a part of the DunsPlus environment. And transferring data throughout the system is as easy as moving a piece of paper from the In Box to the Out Box.

Immediate end-user productivity is not an issue: DunsPlus is a menu-driven system requiring minimal keystrokes for maximum results.

Installation is not an issue: DunsPlus is installed by IBM.

End-user training is not an issue: Training and support are part and parcel of DunsPlus.

Flexibility is not an issue: Any part of the DunsPlus solution—hardware, software, or service—can be tailored to meet your precise business needs.

In fact, there are no issues. DunsPlus does what you want, the way you want it—now.

Designing systems that reflect the way you do business is business as usual for us. NOMAD2, the premier 4th-Generation-Language/DBMS from D&B Computing Services, has made us a leader in the field of information management services. And as your needs evolve, so do we. DunsPlus is just the latest step in translating technological advances into usable business tools —tools that reflect the way you do business.

DunsPlus: An Innovation In End-User Computing From Dun & Bradstreet

DunsPlus

a company of The Dun & Bradstreet Corporation

For further information call: 800-DNB-PLUS. Or drop your business card into an envelope and mail it to DunsPlus, 187 Danbury Road, Wilton, CT 06897.

Lotus spreadsheet and graphics from Lotus Development Corporation. MultiMate™ word processing from MultiMate International, Inc. IBM is a registered trademark of International Business Machines Corporation. DunsPlus is a trademark of DunsPlus, a company of The Dun & Bradstreet Corporation. NOMAD2 is a trademark of D&B Computing Services, Inc.

OA not justified solely on investment return

Cost reductions that accrue, improved decision-making methods should interest execs

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — Justifying office automation by an economic return on the investment alone is myopic, said Tom K. Lewis, the White House director of automated systems. In fact, the intangible benefits of automating an office are almost impossible to measure before a system is installed.

"Return on investment is probably one of the least significant aspects when you are considering OA," added Lewis, who successfully introduced OA to the White House in 18 short months, where now 10 top assistants to the President are devoted terminal users.

Lewis, along with Jeffrey Borrer, vice-president and manager of decision support at First Boston Corp. addressed a session at the recent Federal Office Automation Conference, and both agreed on the difficulty of accurately assessing what kind of economic return there will be on OA hardware, putting micros on managers desks and establishing communications links to mainframe data bases.

However, when a strategic planner is hard-pressed to justify to top management exactly what benefits will result from spending resources to automate, the two MIS strategists suggested similar approaches.

First is the probability that there will be cost reductions that accrue from automation. Automating can cut labor costs, reduce time expenditures, average equipment costs and ultimately save financial resources that would otherwise have been spent. Second, improving the methods of decision making through automation can also be another unquantifiable factor that will justify an investment in OA.

According to Lewis, the vast majority of benefits derived from OA cannot be quantified, since they vary according to each environment. However, "the benefits are more likely at the lower end of an organization than at the top or more strategic level," Lewis said.

In the long run, Lewis said, selling OA solely on its return on investment will not justify its costs. Rather, it is better to sell it as a strategic asset. "What will happen if I don't automate," is a good question to pose to financial management, he said.

Jeffrey Borror, First Boston's manager of decision support, recommended an approach to selling OA that is different from one that most managers working in the U.S. government could be expected to follow — akin to a guerilla approach.

"Go after the senior top executives first. Preferably the younger ones. Don't push, but pick a key target, someone who is interested in the technology for starters. Have some specific applications and solutions that the OA will address. Then you get credibility," Borror suggested.

Finally, Borror recommended that you supply an integrated OA system initially that pulls together the software, micros and mainframes.

Seromda '85 meet set for Nashville

NASHVILLE — The Southeastern Regional Office Machine Dealers Association, Inc. (Seromda) is holding its 1985 convention, Seromda '85, at the Opryland Hotel here using the theme "Keepin' the Tune" from Jan. 31 to Feb. 2.

Aimed at dealers and manufacturers, the convention will feature exhibits and seminars. The keynote speaker will be Tom Hopkins, author of *How to Master the Art of Selling*, who will address the concerns facing office sales representatives every day and techniques and strategies for meeting the concerns.

Other speakers include Richard Flint, who will address management philosophies, understanding and implementation and ideas on how best to work with employees; attorney Robert C. Goldberg, an authority on trade regulation who is affiliated with Schoenberg, Fisher & Newman, Ltd. of Chicago, who will address contracts, warranties, dealer litigation and employee relations; and Don Chilton, president and founder of Sales Developers of Smyrna, Ga., who will address how to establish a sales program for office machine dealers.

Advance registration is $100 for members and $150 for nonmembers. After Jan. 10, registration is $125 for members and $175 for nonmembers.

More information is available from Seromda, Suite 205, 5115 Maryland Way, Brentwood, Tenn. 37027.

EVEN IF YOU CHOOSE THE GENESYS HRMS FOR STRICTLY TECHNICAL REASONS, YOU'LL STILL LOOK LIKE A BUSINESS GENIUS!

Get your company's 401(k) up and running on time. Assure payroll that employees' paychecks will immediately reflect any changes in tax laws, benefits, or union settlements. Automatically generate all the reports required for government compliance, as well as all the information needed to respond to discrimination suits. And, they'll call you a business genius.

All it takes is Genesys. The human resource management system that shows you how to contain costs and add hundreds of thousands, even millions, of dollars to your company's bottom line.

Genesys is the only human resource management system to offer a comprehensive benefits module, as well as leading edge personnel and payroll packages.

Everything you need to manage your company's benefits program. Minority tracking. Employee promotions. Applicant control. Manpower planning. Training and development. Skills inventory. Budget analysis. And more.

Genesys is available as a fully integrated system or in separate modules. With or without a production-oriented IMS/database system designed specifically for your IBM mainframe environment. It's also the only HRMS with electronic mail updates. Which means it'll take that much less time for management to see just how smart a businessman you are.

Genesys. It's more than an HRMS. It's a cost containment system that makes you look like a business genius.

Call or write today. Genesys, 20 Ballard Way, Lawrence, MA 01843. (617) 685-5400

Human Resource Management
That Helps Your Bottom Line

Valid AI definition lost amid industry jargon

CW AI
IPI AI MEET

FRAMINGHAM, Mass. — Artificial intelligence (n): the capability of a machine to imitate intelligent human behavior.

The above explanation, at least according to *Webster's Ninth New Collegiate Dictionary*, constitutes the strict definition of artificial intelligence. But as with any evolving and, unfortunately, overused high-technology buzzword, the term "AI" currently sports a widening variety of confusing and sometimes contradictory definitions.

"If you ask a number of people involved with AI for a definition of exactly what it is, you will probably get n-plus-one answers," Henry Eric Firdman explained recently to a gathering of computer industry and business executives. "There exists a lot of controversy and confusion about artificial intelligence today."

Firdman navigated the executives through a seminar here, sponsored by Rensselaer Polytechnic Institute, titled "Artificial Intelligence and Expert Systems: An Executive Briefing." Firdman is the president of Henry Firdman & Associates, an AI contracting and consulting firm.

What, then, does the term "artificial intelligence" really mean?

"I define an AI system as one that can do three things," Firdman said. "An AI system can acquire new knowledge by communicating to the external world and by inferring from its current knowledge. That communication could be facilitated through sensors, input devices or even another AI system.

"Second, an AI system can carry out goal-directed behavior if it is given a set of goals, strategies for achieving those goals and some adequate knowledge. Finally, it exhibits skill acquisition, meaning that it can improve its performance in certain problem domains based on its knowledge and previous goal-directed behavior experiences."

Firdman said current research undertaken in academia and industry has produced AI systems that exhibit partial capabilities in only one of those critical areas. But to date, he said, no system exists that can boast success in all three realms.

"If a system is truly an AI system," Firdman said, "it will be significantly different six months after you buy it. Thus, any AI product must, by its very nature, be sold as an unfinished product, so to speak."

To aid his listeners in understanding artificial intelligence, Firdman unraveled some of what he labeled the popular but incorrect definitions of AI. For example, he said, many researchers describe AI as the development of computer systems capable of mimicking human reasoning and perception.

"What is wrong with that definition," Firdman said, "is that we do not know much about the mechanisms of human reasoning and perception. In that light, AI is being explained through the unknown."

Others characterize AI as the processing of symbolic information such as concepts, knowledge and relations. "That definition lacks functionality," Firdman claimed. "It is also weak and overly broad. For example, word processing would fall into that definition because it is symbolic information processing. Also, concepts and relations are just particular cases of knowledge, and knowledge processing is by no means all that AI includes."

A third camp, Firdman explained, defines AI as the branch of computer science concerned with designing systems that exhibit the characteristics associated with intelligence in human behavior, such as understanding language, learning, reasoning and solving problems.

"What exactly does that mean?" Firdman queried. "Is solving partial differential equations an intellectual activity? Is human vision an intellectual one? What about driving a car?"

RHONE-POULENC S.A.

and

SILTEC CORPORATION

have entered into a joint venture
for the manufacture and sale of silicon wafers
in Europe.

Rhone-Poulenc S.A. has acquired a
minority equity interest in Siltec Corporation.

The undersigned were advisors
to Siltec Corporation in these transactions.

HAMBRECHT & QUIST
INCORPORATED

New York San Francisco London
Los Angeles Boston Menlo Park

AIM elects top officers, sets board of directors

MONTEREY, Calif. — A. Paul Cox Jr., president and chief executive officer of Data Systems Corp. of Richmond, Va., was recently elected president of the Association of Information Managers (AIM) for 1984-85 at a meeting at the Hyatt Regency here.

Harvey Wilson, senior vice-president of Honolulu Federal Savings Bank in Honolulu, was elected vice-president of AIM.

Other AIM members newly elected to the board of directors include: Hosie Maxwell, president of Comac of Oklahoma City; Lawrence B. Morse, president and chief executive officer of Northeast Datacom, Inc. of Wallingford, Conn.; David M. Tallcott, president of Mutual Thrift Service Center, Inc. of Albany, N.Y.; and Clyde Tew, senior vice-president of Frontier Federal Savings in Ponca City, Okla.

One-year term

The president and vice-president are elected for one-year terms, and board members serve three-year terms.

AIM, an affiliate of the Financial Managers Society, Inc., is a professional society for people responsible for automation in federal institutions or financial institution service bureaus.

Additional information on the organization is available from Dick Yingst, Financial Managers Society, Inc., Communications Dept., Suite 2221, 111 E. Wacker Drive, Chicago, Ill. 60601.

Check and Compare.
ISDM Outperforms the Competition.

Before you buy a system development methodology, check the features that make Interactive Systems Development Methodology (ISDM) the most convenient-to-use system devised to date.

For more information, call (215) 265-1550 or write: ACS Management Systems, Inc., 580 First Avenue, King of Prussia, PA 19406. Telex: 510-6005320.

ACS Management Systems INC
The World's Leader in Project Management Systems

Features	ISDM	Competitive Methodology A	B
Interactive (automated) version	✓		
Structured (generic) version	✓		
Standard version	✓		
Integrated automated estimating	✓		
Integrated project management systems from same vendor	✓		
Project administration guidelines	✓		
Quality assurance guidelines	✓		
Extensive tutorials	✓		
Classes held regularly	✓		
Maintenance methodology	✓		
Data dictionary/data base integration	✓		
Full support by consultant staff	✓		

Speaker: Develop strategic plan for adopting AI

CW AI RPI AI SHEET

FRAMINGHAM, Mass. — Dr. Henry Eric Firdman likes to tell the story of the Soviet researcher who approached the Ministry of Research and Development seeking funding for his pet project.

After explaining the nature of his undertaking, the researcher was asked, "Has the U.S. done any research in this area?" After the scientist expressed his excitement over the fact that he alone was working on such a project, the minister of R&D flatly replied: "No funding. We will not appropriate any money if the U.S. is not interested in this technology."

The anecdote is more than just an insight into what Firdman described as the workings of the Soviet system. Too often, he told attendees at a recent seminar here titled "Artificial Intelligence and Expert Systems: An Executive Briefing," sponsored by Rensselaer Polytechnic Institute, that U.S. corporations take a similar approach to new technology: If the competition is not looking into it, why should we?

Firdman, president of the AI contracting and consulting firm Henry Firdman & Associates, said management would be unwise to adopt such an outlook toward the fledgling technology of AI. He told his audience that AI can help a firm solve its strategic problems through innovative solutions that can also provide leverage over competitors. But to make use of AI technology, management must first draw up a strategic plan.

Components of plan

What are the components of such a plan? "Define your strategic goals first, then determine how AI technology can help you achieve them," Firdman instructed. "Separate your long- and short-term goals, because AI will affect them differently. Do not get involved in the so-called 'most promising' areas of AI, unless you have a strong scientific or technological backlog and the proper resources to address such a backlog."

Firdman advised management to organize a special in-house task force, possibly assisted by an outside consultant, composed of people with a broad knowledge of AI and an understanding of the human factors, such as fear of job loss, that are involved in the adoption of AI technology. The task force should review the company's operations for major problems, or bottlenecks, that an AI application could solve. The team should then choose one or two of the bottlenecks as "test beds" and outline the resources needed to undertake the AI application and the expected results of the test project.

"Figure out the return on investment you expect from any test bed project chosen, then decide whether it is worth undertaking," he said. "If the answer is 'no,' you have at least acquired new, objective knowledge about your organization obtained from a specific viewpoint. If the answer is 'yes,' you will have avoided the situation of hiring people [AI consultants or researchers] needlessly."

Firdman said that his research into corporations that have undertaken internal AI projects has pointed out three major lessons other companies would do well to learn. First, AI must have what he called "internal champions" among top management or plans and projects may wither on the vine. In addition, Firdman said that the selection of the first AI application is crucial to the success of a firm's entire foray into that new technology.

"The answer to the criticism that AI people do simple things with very complex tools," he said, "is that they want to survive to do more complex things in the future."

Finally, the AI decision-making process must be adapted to the company's corporate culture.

The following are some of Firdman's other tips for making an internal AI venture successful:

- If your task force cannot explain to you in plain English what you should be doing and with what end in mind, it is not worth doing.
- You must know exactly what you want to do before you hire an AI project manager.
- Use external consultants not only as members of the task force but as external auditors during regular project reviews.
- Do not be hesitant about closing down a project if it is not advancing in the right direction.
- When a prototype AI system is developed, use expert judges to assess its performance, and test the prototype in the field as extensively as possible.

"I have no doubt that in the long term an investment in AI is a good thing," Firdman said. "AI is like the research undertaken into nuclear physics in the 1940s. No one understood the importance of what all those scientists were working on in the desert. Then one day they saw the mushroom cloud, and they all understood."

JÀ VU DÉJÀ
U DÉJÀ VU
DLI/ONLINE.
So familiar, you'll think you've used it before.

DLI/ONLINE supports the DL/I commands you already know — like "get" calls, ISRT, REPL and DLET. It's the full-screen, interactive editor for all your IMS databases. And DLI/ONLINE is as easy to use as your text editor.

One screen does it all. You can make a few changes and get in and out of the database quickly. Test calls faster, validate logic, look at PSB, PCB and DBD information. Zap test data and keep development moving.

DLI/ONLINE. You'll want to be there. Find out more about DLI/ONLINE today by calling DBMS, Inc. toll-free at 1-800-323-6361. In 312 area, dial 961-5700.

DBMS, Inc.

DBMS, Inc.

1801 Mill Street, Naperville, Illinois 60540

N.Y.-area banks to tie ATMs into single net

By James Connolly
CW Staff

NEW YORK — Eight New York-area banks plan to link their 750 automated teller machines (ATM) into a single network that would let their customers withdraw cash from any of the banks' teller machines.

The network, which the banks hope to expand throughout the Northeast and into Florida, is being tested now and will be operating by the end of 1984, pending approval by the Federal Reserve Board.

The operating group, the New York Switch Corp., plans to offer the services provided by national shared networks on a metropolitan basis. A spokesman for the company said 30 more financial institutions have expressed interest in the network.

The eight founders include the Bank of New York; Barclays Bank of New York, N.A.; Chemical Bank in New York; Manufacturers Hanover Trust Co. in New York; National Westminster Bank, U.S.A. in New York; Goldome Bank and Marine Midland Bank, N.A. of Buffalo, N.Y.; and Union Trust Co. in Connecticut.

"The idea appeals mainly to commuters — people who may live in [Westchester county in New York] and commute to [New York City]. They will have the benefit of using Bank of New York machines in Westchester and the benefit of Chemical Bank or Manufacturers Hanover in the city where they work," said Alan Pohlman, a spokesman for New York Switch.

Leonard E. Malkin, chairman of the steering committee for New York Switch, estimated that the participating banks have 2½ million proprietary ATM access cards and more than two million ATM-qualified Mastercards and Visa cards outstanding.

Pohlman said the links among the banks will be through a Timeplex Corp. multiplexer marketed by AT&T Information Systems and installed in New York Switch's Fort Lee, N.J., headquarters. Each bank's ATM processors will have dedicated 2,400 bit/sec lines to that multiplexer, which will be connected by 9,600 bit/sec dedicated lines to a switch in New Berlin, Wis. That switch, consisting of Tandem Computers, Inc. Nonstop II and TXPs, is operated by A.O. Smith Data Systems, which developed the software for the switch.

When a customer begins an ATM transaction, the ATM's host processor will detect whether the customer's access card is from that bank or another participating bank. If it is another bank's card, the transaction will be routed to Fort Lee and on to Wisconsin, where the Tandem will identify the appropriate bank and, again through Fort Lee, query that bank as to the account status.

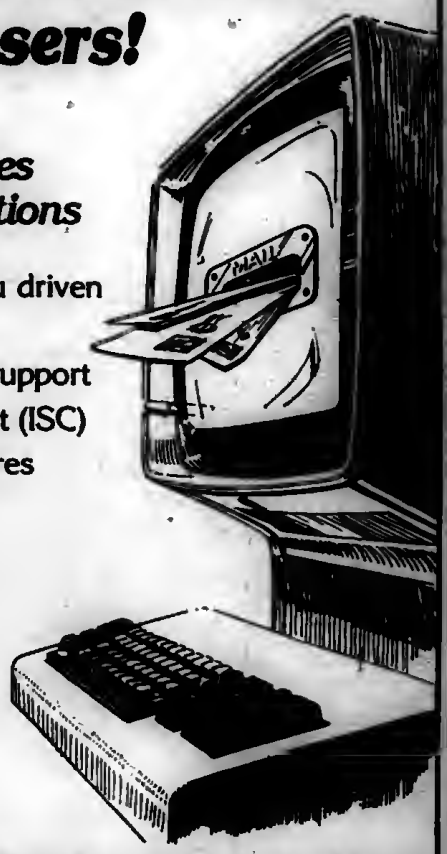
The customer's own bank can approve the withdrawal and record it in the same transaction. The approval is relayed back through the Tandem, and the cash is dispensed. Pohlman said the entire process should take about five seconds longer than with the previous systems, where customers could withdraw cash only at their own banks.

The system will not allow customers to make deposits or payments at banks other than their own.

Now – Electronic Mail for CICS users!

SYSM® streamlines your communications

- Easy to use — menu driven
- In / Out baskets
- 327X / 328X / TTY support
- Multiple CPU support (ISC)
- All the needed features
- Over 200 users



For more details on SYSM® call: (208) 377-0336

HW™ H&W COMPUTER SYSTEMS INTERNATIONAL
P.O. BOX 4785 • BOISE, IDAHO 83711

System check ends search for terrorists

By Donna Raimondi
CW Staff

A gang of alleged terrorists — subjects of an intense nationwide manhunt for years — were flushed from their hideouts earlier this month after police officers did a simple computer cross-match that revealed the group's location.

Federal agents in Ohio arrested five fugitives with a long history of political terrorism, bank robbery and murder after a license check by Massachusetts State Police turned up an alias used by Patricia Gros — wife of alleged terrorist Raymond Luc Levasseur — who was wanted for questioning in the brutal Dec. 1981 murder of a New Jersey State Trooper.

Massachusetts State Trooper Richard J. Barrett said police came up with an alias that was eight or nine years old by following leads. An ex-neighbor of Gros' in Connecticut remembered that seven years ago Gros was in an accident when she lived in that state, and a check of Connecticut license files showed the same name and date of birth information as one of Gros' known aliases, he said.

Massachusetts State Police Cpl. Frederick J. Roberts said the information was entered into the Massachusetts Law Enforcement Agency Processing System, which runs on a Burroughs Corp. B7900 mainframe with approximately 300 of the state's towns linked via terminals. The alias information was then run through the computerized records of several states, turning up again in New York and finally in Ohio, Barrett said.

Gros' alias had been lifted from the records of a baby who died in Lowell, Mass., around the time of Gros' own birth, Barrett said. Even though Gros changed her name many times since becoming a fugitive, she kept the license alias the same throughout her stay in Connecticut, New York and Ohio, where she and her gang were picked up.

Lt. Joseph Kobus of the New Jersey State Police said that, following the murder of trooper Philip Lamonaco in 1981, more than 250 troopers searched for members of the gang. Task forces from the New England states and New York had been searching for members of the gang since 1977.

Q: How Many People Are Afraid Of Your 4-GL/DBMS?
A: None, If You Have EZNOMAD.

That's right. EZNOMAD is a major extension of NOMAD2 that pulls novice and infrequent end-users into the mainstream of mainframe computing. EZNOMAD's screen-driven environment requires no key words, system commands, or knowledge of syntax for operation.

With EZNOMAD, your end-users can sit back and follow a series of English-language instructions, menus, and pick-and-point screens. Now, those busy "management types" who "never have the time" to learn mainframe computing don't need to take the time. Infrequent users no longer need to "relearn" the system every couple of months.

EZNOMAD's micro-like capabilities access essentially all of the functions and power of NOMAD2. Imagine a senior manager in your company developing databases, creating applications, maintaining databases, and writing ad hoc reports — without your help.

Your senior management will not only be pleased with the capabilities of EZNOMAD, they will also be delighted with the cost of EZNOMAD—its free to all NOMAD2 licensees.

In other words, you get the ease-of-use of a micro and the tremendous power and flexibility only a mainframe can deliver. And the price is right.

It's nice to know that when you pick NOMAD2 as the 4-GL/DBMS for your company, EVERYBODY will know first-hand that you've made the right choice.

EZNOMAD is the latest innovation in end-user computing from Dun & Bradstreet. NOMAD, now NOMAD2, has evolved over the years to keep pace with the demands for providing business professionals with maximum computing power. EZNOMAD is a major stride in that direction.

NOMAD2:
An Innovation In End-User Computing From Dun & Bradstreet

D&B Computing Services

A company of The Dun & Bradstreet Corporation

For more information call: Roger Cox at (203) 762-2511. Or drop your business card into an envelope and mail it to Roger at: D&B Computing Services, 187 Danbury Road, Wilton, CT 06897.

NOMAD is a registered trademark of D&B Computing Services, Inc.

NEWS

System integration vital to role of MIS exec

CW AT ENTERPRISE INFO SYSTEMS

By Kathleen Burton
CW West Coast Bureau

SAN DIEGO — Without more sophisticated systems integration between mainframes, microcomputers and minis, the MIS director's task of "having the right information in the right place at the right time is an impossible job." The multivendor environments that exist in Fortune 1,000 companies today make integration both inevitable and necessary during the 1990s, Robert T. Fertig, president of Enterprise Information Systems, Inc., of Greenwich, Conn., said in his keynote address at the sixth annual Enterprise Information Systems Forum held in San Diego this month.

Electronic mail applications are limited by the lack of graphics support and by the technical naivete of companies becoming involved in the technology.

Two key benefits to integrated systems, he said, are the ability to share critical resources and information and the elimination of unnecessary barriers to the free flow of information.

Future operating systems will be the most suitable place for integration to occur, Fertig said, and next-generation operating systems should provide facilities for integrating data bases, data communications devices and graphics. Of the many stand-alone operating systems, integrators and operating system extensions that exist in the marketplace today, (including Apple Computer Corp.'s Lisa, Visicorp's Visi On and IBM's Topview), the Windows operating environment from Microsoft Corp. has emerged as the de facto standard for intramachine integration, Fertig said. Windows has been adopted by IBM, Digital Equipment Corp., Xerox Corp., Apollo Computer Corp., Digital Research, Inc. and other manufacturers, largely because it permits data to be viewed concurrently, he said.

During the remainder of the 1980s, there will be a proliferation of more sophisticated micro-to-mainframe links, Fertig said. These links will lower systems costs, provide higher productivity through faster response times, allow greater integrity of messages and superior security, decrease telephone and host connect times, coordinate CPU access with periods of low host utilization and enable the host to support increasing numbers of remote sites.

Presently, there are four viable software technologies for micro-to-mainframe links, Fertig said. These are terminal emulation, file transfer, electronic mail and distributed data processing. According to Fertig, electronic mail applications are still limited by the lack of adequate graphics support and because of the diversity and technical naivete of companies becoming involved in the technology — from small independents and public utility companies to conglomerates like MCI Communications Corp., Western Union, Inc. and GTE Telenet Communications Corp.

Interface consistency

"A key [criterion] necessary to integrate distributed data applications is developing interface consistency that is independent of its location," Fertig said. "Both ends of the link should have a consistent user interface and be able to run identical equipment at both ends of the link." So far, this has not been achieved, he said. An IBM Personal Computer XT/370 running IBM's Ramis/II or Information Builders, Inc.'s PC/Focus software, coupled with an IBM VM host, would provide today's optimum distributed solution, Fertig said.

A critical problem that has until now prevented development of commercial distributed applications for intermachine and intramachine integration, he said, is the "layer six problem." (Layer six is the presentation layer of IBM's Open Systems Interconnect architecture that translates information between incompatible formats.) Layer six format translations are usually less than 70% accurate, Fertig said, resulting in serious degradation of source data during transmissions. It is possible to solve the problem, Fertig said, by using format translations to map data exchanges between incompatible systems or by sending rules and data simultaneously.

Offering the best solution to date, Fertig said, IBM has developed three architectures — the Document Interchange Architecture, Systems Network Architecture and the Document Content Architecture — that "act as a glue" to solve portions of the integration problem.

MANY UNIX-BASED SYSTEMS
ONE UNIX TRAINING COMPANY

The Computer Technology Group provides the UNIX training solution. Training to fit the complexities of your UNIX-based system.

Three factors make the Computer Technology Group the experts in UNIX and 'C' language training:

- Experience, through training thousands of students worldwide in live seminars, with thousands more using our video training at their own locations.
- Extensive Curricula Supporting All UNIX Versions, creating a client base of manufacturers, software developers and end users.
- Quality of Instruction, with instructors and course developers who are experts in teaching UNIX and 'C', as well as in designing and implementing a variety of UNIX-based systems.

ONE UNIX TRAINING COMPANY
MULTIPLE DELIVERY SYSTEMS

Whether you're training two, 200, 2000...you can select the most efficient and economical training solution for your unique environment:

- Public Seminars offered in major cities throughout the world.
- On-Site Seminars for training customized to your system and to specific groups within your organization.
- Video-Based Training for consistent training that is always available at your location.
- Interactive Videodisc Training, which dynamically tailors courses to the individual—from novice to expert programmer.

ASK FOR OUR 48-PAGE COURSE CATALOG, WHICH PROVIDES:

- Comprehensive course outlines
- Course prerequisites
- Curriculum recommendation for multiple audiences
- Guidelines for cost-effective training media selection
- Current seminar schedule

CALL (800) 323-UNIX or
(312) 987-4082 in Illinois

™ UNIX is a trademark of Bell Laboratories.

COMPUTER TECHNOLOGY GROUP
Telemedia, Inc.
310 S. Michigan Ave., Chicago, IL 60604

CONDUCTOR: The MIS Approach to End-User Access

Today—end-users need greater access to data. And MIS needs better control. To solve both problems, TSI introduced CONDUCTOR.

CONDUCTOR lets end-users get the data they need. CONDUCTOR selects, manipulates and delivers data to any end-user environment. Without programming. And CONDUCTOR gives MIS more control than ever over quality and integrity, with a new degree of security.

While others have tried to solve the end-user problem, they've only addressed a small part. CONDUCTOR goes for the big picture. So remarkably different, there's virtually nothing else like it.

CONDUCTOR is the latest innovation in software from Dun & Bradstreet. As such, it joins NOMAD, now NOMAD2, the premier 4-GL/DBMS from D&B Computing Services, and DunsPlus, the "people literate" microcomputer that reflects the way you do business.

Find out about TSI's CONDUCTOR today. We're sure you'll like the way it helps you CONDUCT business.

TSI International:
Innovations In Managing End-User Computing From Dun & Bradstreet

TSI International
a company of The Dun & Bradstreet Corporation

For the facts on CONDUCTOR, call 1-800-227-3800, Ext. 7005 or drop your business card into an envelope and mail it to Marketing Service, TSI International, 187 Danbury Road, Wilton, Connecticut 06897.

NOMAD is a registered trademark of D&B Computing Services, Inc. DunsPlus is a trademark of DunsPlus, a company of The Dun & Bradstreet Corporation.

Computer collects campus crime statistics

By Duane Raimondi
CW Staff

ALBANY, N.Y. — Crime reporting requirements in the state of New York recently served as a vehicle to test the state university's new data base management system (DBMS) and fourth-generation language.

The State University of New York (Suny) is comprised of 375,000 students and 40,000 employees dispersed throughout 29 campuses all over New York. To keep track of crimes on the various campuses, Suny security staff members send crime data to the state computer center in Albany, said Tom Rysedorph, assistant director for systems development at the Research Foundation at Suny-Albany.

The computer center processes the information and forwards it to the state's criminal justice department once a month to satisfy state crime statistics requirements, he said.

Suny's security officers had never used the university's computer facility, which runs an IBM 3033 under MVS/CICS, Rysedorph said. When the university acquired an Applied Data Research, Inc. (ADR) Datacom relational DBMS and ADR's Ideal language this year, security requested a new crime reporting system that would allow its officers to enter data interactively and to generate ad hoc reports for its own use as well as the statistics for the criminal justice department, he said.

With the old system, security staff members filled out paper forms and forwarded them to punch card/data entry staff at the computer center in Albany, which collated the information on tape, put it through several batch programs with interim edit/audit lists and returned the tape to the security director for error checks, Rysedorph said. Once corrected, the tape was sent on to the criminal justice department, he said.

Exercising options

Members of Rysedorph's group looked at the request for a new crime package as a pilot to help them fully understand the new products, he said. "We wanted to exercise all the options and alternatives available to us and throw in all kinds of problems in order to adapt to users' needs as they become more sophisticated," he said.

The ADR system had been acquired after a search of other DBMS, Rysedorph said. "We felt that [IBM's] IMS belonged to major corporations with data base staff in the hundreds and multiyear development cycles," he said. Cullinet's IDMS needed a highly technical data base administrator, he said. "It is very hard to obtain data administration at a high level given the salaries of state employees," he added. For the Datacom relational DBMS, the data base administration is less technical, more administrative and more user-oriented, he said.

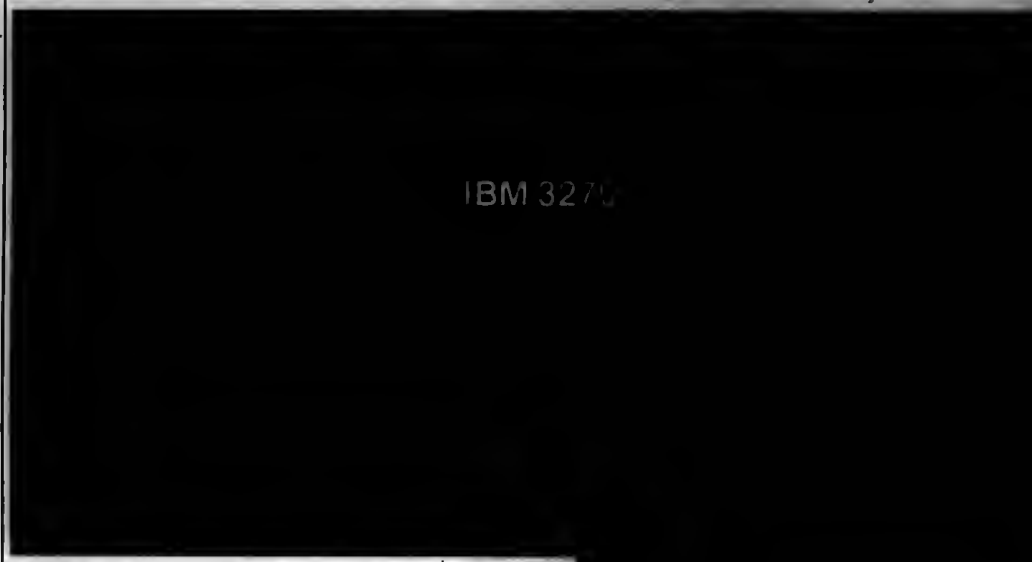
The fiscal constraints of the university also had a lot to do with the Crime Incident Reporting package's design, Rysedorph said. Little money is available for training, and New York's snowfall will make it difficult for users to travel to the center in Albany for training, he added.

"We placed procedures into Help panels that users can access by hitting a function key when they get an error message. We also provided a function where they could hit a button and get all the errors found on a screen," said Ralph Bennett, senior project leader.

Bennett trained personnel from three pilot campuses in Binghamton, Canton and Potsdam and found that training in the application itself was easy, he said, but familiarizing the staff with computer use in general was difficult. "They got hung up on getting their passwords in correctly," he said, and they had some problems figuring

See SUNY page 35

IBM 3270 users: you can the mini/micro universe



Click. Flip the switch on the Matchmaker 2000 and your 3270 terminal thinks it's a VT-100. Now you can communicate with a micro or mini computer. Access data networks such as Dow Jones and The Source, as well as local area networks, such as Net One. Send and receive electronic mail. Now the whole universe of ASCII is open to you.

Click. Flip the switch back to 3270 mode and the Matchmaker 2000 "disappears." You have a transparent path from your terminal to your IBM cluster controller. And there's no interference with the flow of data. No loss of speed. No reduction in capability.

$695. The Matchmaker 2000 is the enhancement for 3270 type terminals that allows them to emulate VT-100, ADM-3A and other types of ASCII terminals and to access a wide range of mini and micro computers. DEC. Hewlett-Packard. Data General. Prime. Texas Instruments. And others. Access them directly. Or through a modem. Via data switch or PBX at speeds from 110 bps to 19.2 Kbps.

Plug-in installation between terminal and cluster controller is quick and easy. Operation is simple. A single switch takes you from 3270 mode to ASCII mode and back again. And the cost? Only $695.

IBM is a trademark of the International Business Machines Corporation. DEC, VT-100 are trademarks of the Digital Equipment Corporation. ADM-3A is a trademark of Lear Siegler, Inc. HP is a trademark of Hewlett-Packard Co. The Source is a service mark of Source Telecomputing Corp. Net One is a trademark of Ungermann Bass, Inc.

Computer counseling may reduce marital stress

By Donna Roimondi
CW Staff

MIAMI — To the list of dedicated ministers and psychologists who specialize in alleviating marital stress, add one Sperry Corp. computer.

Mathematicians at the University of Miami here are using modeling techniques to identify and prevent sources of conflict in a marriage, said Dr. Bernard Howard, professor of mathematics and computer science.

People are like black boxes; they have finite states that include input, internal and output states, Howard said. As a result of input, the internal and output states change, he added.

Howard and his affiliates have spent the last 15 years developing a system of pinpointing behavior, rating the behavior on indexes and identifying alternative actions that could act as a tool to help reduce stressful conduct, he said. The computer simulates the dynamic behavior of the system from all possible internal situations and displays a tree to show possible behaviors. It computes various indexes — strife, compatibility, acceptability — and gives a "batting average" from zero to 1,000.

Each member of a couple answers a set of eight questions that Howard and his team designed to reflect the internal state, he said. The computer then analyzes current behavior, and a psychologist validates the results. Once the analysis is accepted, an index is given and the computer searches through all possible changes each individual could make to increase successful conduct.

Howard and Dr. Henry Kunce — a former Presbyterian minister/counselor and now a behaviorist at the university — wrote 30 programs in two classes (discrete and continuous modes) to apply to interactive behavior. They tested their programs by running more than 300 cases Kunce had worked on in his counseling days through the system, and the computer simulated what had really happened in every one of those situations, Howard said.

Dr. Joseph Kunce, a psychologist at the University of Missouri, experiments on couples and gathers data, which Howard and Henry Kunce process on a Sperry 1100/82 mainframe.

His research team has experimented on corporate decision-making processes and racially tense political situations; the hope is to someday use the system for smoothing relations between world leaders, arbitrating labor conflicts and defusing racial conflicts, Howard said.

now access
with one simple move.

click.

MTI designed the Matchmaker 2000 around an Intel control microprocessor for proven reliability. Then added self-diagnostics, high speed scrolling, and a security feature to prevent unauthorized access of your host computer from the ASCII side.

The result is a simple, dependable, versatile enhancement that every 3270 user should have. Because there's a whole universe of ASCII out there waiting for you.

So make one simple move. Return the coupon today for complete details. Or, if you can't wait, call 800-622-1500 from outside California, 714-220-1003 in California, for immediate attention.

MTI Systems Division
6481 Global Drive, Cypress, CA 90630

Send me information on the Matchmaker 2000.
OEM inquiries invited.

Name
Title
Company
Address
City
State
Zip

MTI

MTI is a subsidiary of Manufacturing Technologies Incorporated.

SUNY from page 34

out how to access their IBM 3101 or 3278 terminals via different control unit devices."

Another problem with training has been that the Justice Department insisted on 100% accuracy in the new reporting methods, and the security department was used to allowing errors they considered to be noncritical.

For example, said Platt Harris, director of university public safety, the only traffic violation allowed on the criminal justice report is driving while intoxicated, but the security department had previously included other traffic violations for its own information.

Now, everything has to conform to justice department rules, Bennett said, and it has taken the users a while to realize that they have a tool that will readily tell them what is unacceptable so they can fix faulty reports.

Ryzedorph's group prepared itself to write the program by attending users group meetings in Boston, Toronto and upstate New York, and by talking frequently with ADP's technical support people.

UK firms plagued by misguided DP purchases

By Lisa Israel
Special to CW$

LONDON — A subsidiary of a large UK manufacturing company spent two years developing a production and control system without producing a single working application.

The company's data processing department, which recommended a mainframe for the application, now recognizes that it made a mistake and has turned to a minicomputer to do a quicker and cheaper job.

According to Max Hand, a management consultant at the firm of A.T. Kearney, "Top and middle management should have controlled that project, not DP. If you leave it to DP, you will get the wrong solution."

Hand reached his conclusion after researching the use of information technology at more than 200 companies. Backed by the UK's Department of Trade and Industry and the Institute of Administrative Management, the research arrived at one horrifying conclusion: 20% of an estimated $5 billion to $6 billion in computer spending in 1984 will go to waste.

The study divided informaton technology users into "leaders" — companies that are coming to terms with information technology — and "laggers" — companies that leave themselves behind. The study found that only a quarter of the companies surveyed fit into the first category.

The rest are making all kinds of mistakes, according to Hand. "They are buying the wrong machines, spending too long or too much on developing systems and not getting the most from them when [the systems are] installed."

Hand tells hair-raising stories of money misspent at large and small firms in fields ranging from finance to construction to local government.

Hand places the blame firmly at the door of top management for not setting the right objectives for their DP departments. "Lagging companies do not really know what to do with technology. They don't understand it. It is almost an embarrassment to them, so they do the traditional, easy things," he said.

An example of this approach was used by one well-known construction company interviewed by Hand, which had all the right applications, but failed to win full benefits from automation.

The firm had put its accounts on computer, but still carried out its annual consolidation by hand. It also had a payroll package for several thousand employees but worked out some calculations manually. Employees were working as hard with a computer as they had without one.

"This particular company didn't know what the hell to do with information technology," Hand said. "The DP department was too busy responding to immediate requests. If they had sat back and thought about it, they could have automated functions on their construction sites."

Without confidence in its own judgment, top management shifts responsibility for DP decisions to DP managers, who then make the wrong decision. This is because DP managers do not always know the computer strategy that will best help a business, Hand maintained. "Nor should they be expected to; they are trained to find technical solutions, not to formulate business tactics."

Cost justification of computer-related projects is another problem for companies because so many of the benefits from computerization come in crossing intracompany barriers that managers find difficult to cross.

It is also a problem because savings are difficult to quantify from piggyback benefits like electronic mail or office automation. The survey estimates that confusion over job-costing can prevent firms from seeing more than 70% of the benefits of information technology.

'Bouncing off a brick wall'

Furthermore, even when DP managers recognize that computers are not being used to full advantage, bringing recommendations to the board's attention is like "bouncing off a brick wall," Hand claimed.

"DP managers do not always know how to put forward a business case for a better system. . . . In short, what the survey identifies is a gap between business strategy and computer policy."

Top managers need to change their attitude toward computers, Hand advised. "A system is not just a big box that maximizes staff productivity and saves on wage costs," he said, adding that the latter is the stated aim that outweighed all others for computerization by 80% of companies surveyed.

"Information technology must be aligned with a company's business strategy," Hand reiterated. "A firm must work out what it wants to do and then work out what it wants from information technology. This has got to be done by top management, and it's a strategy that can then be implemented by DP managers."

Israel is a reporter with Computer News, *the UK-based affiliate of* Computerworld.

CSR
COMPUTER SYSTEMS RESEARCH, INC.
1-800-822-1180
Developers of the IBM Personal Computer Instructional System.

Standards directory out

WASHINGTON, D.C. — The National Bureau of Standards has issued a directory of standards developed by trade associations, technical and professional societies, federal agencies and state governments.

"Standards Activities of Organizations in the United States (SP-681)" summarizes the activities of more than 750 organizations in the U.S. as well as 420 private sector groups. The directory also contains a list of 632 nongovernment groups that develop standards, contribute to the standardization process or are sources of documents and information.

The standards directory, stock number 003-003-02602-6, is available for $13 prepaid from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Unix users meet set for January

DALLAS — Uniforum '85, the International Conference of Unix Users, will be sponsored by Usr/Group at Infomart here on Jan. 21-25, 1985.

Fourteen all-day tutorial sessions will be held on Monday, Jan. 21, and conference sessions are scheduled in four tracks: office systems, personal computers, engineering/programming and market trends.

Vendors of AT&T's Unix hardware, software and services will exhibit their products at the international event.

Registration fees

Registration prices are as follows: for the show only, there is no fee if preregistered, and registration is $10 on-site; for the tutorials, there is a $100 fee if preregistered and it costs $150 on-site; and the price for the conference is $125 in advance and $175 on-site.

Special conference rates apply for members and students.

More information is available from Uniforum, which is located at Suite 205, 2400 E. Devon Ave., Des Plaines, Ill. 60018.

VAX ALL YOUR FLOORS WITH SMARTSTAR.

and a very profitable

What if everyone in your office were suddenly able to design their own applications, whether they know anything about programming or not? What if this left you and your computer professionals free to concentrate on really important jobs?

Well, this is exactly what SMARTSTAR does. It puts the power of the VAX in the hands of those who know how to run a business, but know

about programming. They get information fast. So they can make decisions fast. Productivity skyrockets. And so does profitability.

Programmers are relieved of the tedious jobs, the busywork—and most important, the backlog of programming jobs that will now be handled by end-users.

For complex applications, SMARTSTAR's structured interface and built-in utilities reduce development time by

10 to 1 [illegible]

DEC's [illegible]

Digital [illegible]

5951 Encina Road • Goleta, [illegible]
Call toll-free [illegible]

VAX, DEC and Rdb are trademarks of Digital Equipment Corporation.

CCA introduces the most effective solutions

Application development. End user computing. Office automation. These are probably the three hardest challenges facing every MIS department.

Now there's a way to crack all three. From CCA. With three of the most innovative solutions ever developed.

Only CCA could do it. Because CCA has 20 years experience in researching and developing software technology.

1. WORKSHOP/204. The single most powerful set of tools for crushing the application backlog.

Our new WORKSHOP/204 is a collection of integrated tools that is unparalleled for speeding up application development.

WORKSHOP/204 guides the developer through the entire process. Databases are designed automatically. Prototyping becomes a simple task with fill-in-the-blank forms. Screens and menus are "painted" with a powerful electronic palette. And the most complete application development language lets you add processing logic.

WORKSHOP/204 even allows a PC to be used as a development workstation. A dictionary drives the entire process and provides complete control and integration.

WORKSHOP/204 does all this in a fourth generation environment. And because it's interactive and menu-driven, it's also easy-to-use.

If you want to get complete applications online 5 to 50 times faster, WORKSHOP/204 is the way to do it.

2. INTELLIGENT INFORMATION CENTER. An integrated system for giving executives access to the database.

Business managers need useful information, not meaningless data. The INTELLIGENT INFORMATION CENTER is a complete set of tools that allows them to get what they need themselves. Without having to understand anything about mainframe technology.

The INTELLIGENT INFORMATION CENTER includes an easy-to-use PC/mainframe link that downloads data and creates spreadsheets automatically. There's also a powerful, menu-driven query and reporting system and a completely automated application generator. Plus interfaces to tie into other decision support systems. And a utility to quickly load data from commercial databases to your own. In addition there's an administrative tool that controls data access and documentation.

The INTELLIGENT INFORMATION

to today's three toughest MIS problems.

CENTER is the smart answer to automating corporate end-user computing needs.

3. PROD/NET. The only OA system that can integrate PC's, word processors, LAN's and hosts using existing hardware.

PROD/NET is the first and only system that lets you totally integrate office automation equipment and host computers into a single communications system. Using the hardware and technologies you already own.

No other product comes close to the completeness of PROD/NET. For one thing it lets you connect PC's into efficient local networks so they can communicate with each other, handle multi-tasking, and share expensive peripherals. It also allows documents to be translated automatically from one type of word processor to another. And host-based SNA communication transfers data between host terminals, word processors and the PC networks.

PROD/NET can give everybody in the office direct access to the corporate database. Probably no investment you could make will make your company more efficient and effective.

MODEL 204 DBMS. The kernel of a complete corporate information environment.

CCA's relational MODEL 204 is the fastest growing DBMS for IBM mainframes. It gives you productivity with performance, plus ease-of-use, efficiency, flexibility and capacity. Qualities that make it the perfect foundation for your corporate information system.

WORKSHOP/204. The INTELLIGENT INFORMATION CENTER. PROD/NET. MODEL 204 DBMS. Only CCA offers the total solution to managing the corporate information environment.

To get more information in your hands, please call **1-800-256-4100.** Or write Computer Corporation of America, Four Cambridge Center, Cambridge, MA 02142.

Computer Corporation of America.

A Cincom Company

Foreign vendors showcase wares at Comdex

Japanese, Australian, English vendors highlight product introductions in '84

By Susan Biskeney
CW Staff

LAS VEGAS — Among the 1,400 exhibitors at the recent Comdex/Fall '84 here were several international vendors looking for customers, dealers or partners in the U.S.

Fujitsu Microelectronics, Inc. unwrapped its Micro 16SX, an Intel Corp. 8086-based personal business computer that features 384K bytes of random-access memory, a 10M- or 20M-byte built-in Winchester hard disk drive and a 360K-byte, 5¼-in. half-height floppy disk drive. The machine is also equipped with a real-time clock with battery backup, a serial communications port, a parallel port, a graphics subsystem and an eight-color monitor. The system can operate on Microsoft Corp.'s MS-DOS and Digital Research, Inc.'s CP/M 86 or Concurrent CP/M 86 operating systems, a spokesman added. Pricing on the Micro 16SX begins at $4,250.

Time Office Computers of Australia showed the Emu Ergonomic Workstation and the Kookaburra Portable Computer. The Emu was designed by Ferdinand A. Porsche's Design Studio to meet all presently documented ergonomic standards. The screen features six-directional motion and leaves no footprint on the user's desk as it is suspended by a moveable arm. The keyboard is sculpted and padded and comes complete with a hand rest bar. Pricing on the workstation starts at $5,000.

The vendor's Kookaburra machine is an Intel 80186-based, 9-lb system featuring up to 256K bytes of random-access memory, three ports, bundled MS-DOS 2.1, word processing, spreadsheet and diary software. The system can run on battery or main power supply. It costs $2,200.

Also from Australia was the Squirrel Ltd. Relational Database Management System, said to offer the same capabilities as IBM's SQL fourth-generation language to users of micros, minis and mainframes. The software also features data manipulation capabilities, security control and indexing and data definition facilities. Pricing starts at $2,400.

NEC Information Systems, Inc., the Boxborough, Mass.-based subsidiary of NEC Corp., unveiled an electronic mail system that enables up to 10,000 users of the vendor's Astra 300 VS series of 32-bit minicomputers to communicate with each other. Priced at $2,000, Astra Electronic Mail sends and receives messages within the Astra system from workstations, personal computers, portables and asynchronous terminals, according to the vendor. Multiple copies of up to 10,000 can also reportedly be sent to the system users.

Sony Corp. introduced its Compact Disk Read-Only Memory (CD ROM) product, which offers 540M bytes of memory on a single 4.72-in disk, which the company said has 500 times the capacity of conventional floppies. Digital encoding techniques combined with laser optical technology form the basis of the CD ROM format, originally devised in conjunction with Philips Information Systems, Inc. as a high-fidelity audio storage medium, according to a vendor spokesman. Sony intends to deliver samples of this product during the first quarter of 1985.

Sony also expanded its line of high-resolution Trinitron red-green-blue monitors. The additions included 9-, 12- and 13-in. screen models. All three are compatible with the IBM Personal Computer product line, and pricing starts at $550, the vendor said.

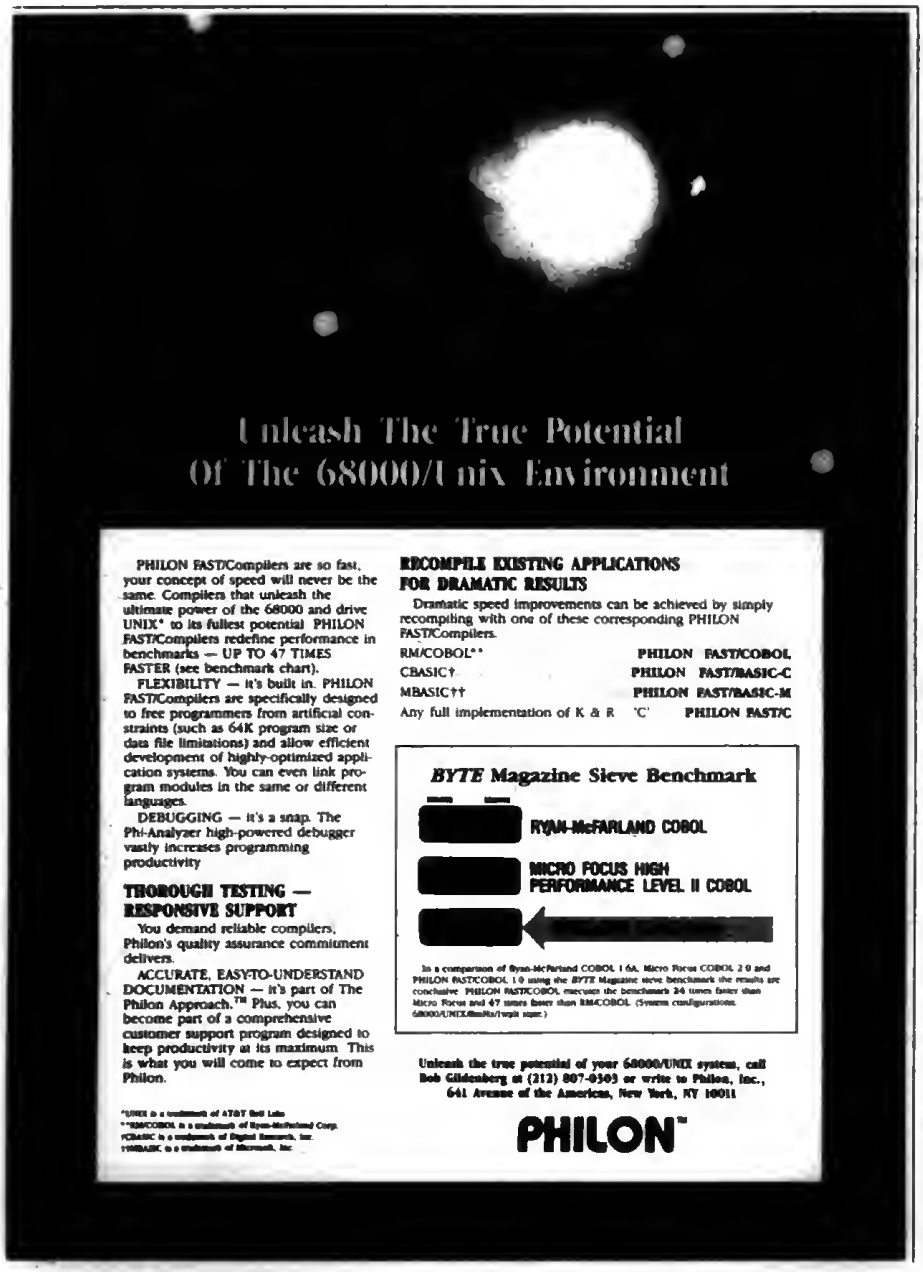
The UK's Newbury Data Recording introduced Penny, a 3½-in. fixed-disk drive offering 50M bytes of storage and an average access time of 40 msec. It costs $5,000 per drive.

Aimed at life cycle control

Introduced by Yard Software Systems Ltd., also of the UK, was Lifespan, an automated configuration management system. This product was designed to allow managers and developers more control over their software throughout its life cycle. Lifespan runs on Digital Equipment Corp.'s VAX line of machines using VMS. Lifespan does not require extra staff to implement, nor will it slow down the software development process, according to the vendor. It is priced at $19,000.

Apricot, Inc. of the UK unveiled the Apricot F1s, a 512K-byte version of its F1 entry-level business micro. With a price tag of $1,995, the F1s features an 8086 microprocessor, 512K bytes of random-access memory (RAM), expandable to 768K RAM, a 720K-byte, double-sided 3½-in. disk drive, infrared keyboard, color graphics and an optional mouse.

Apricot also introduced the Apricot Portable, a 13-lb system equipped with many of the same features as the vendor's F1 micro with the added features of voice recognition, infrared mouse and a full-size flat panel display. This machine costs $1,695.



PHILON FAST/Compilers are so fast, your concept of speed will never be the same. Compilers that unleash the ultimate power of the 68000 and drive UNIX* to its fullest potential. PHILON FAST/Compilers redefine performance in benchmarks — UP TO 47 TIMES FASTER (see benchmark chart).

FLEXIBILITY — It's built in. PHILON FAST/Compilers are specifically designed to free programmers from artificial constraints (such as 64K program size or data file limitations) and allow efficient development of highly-optimized application systems. You can even link program modules in the same or different languages.

DEBUGGING — It's a snap. The Phi-Analyzer high-powered debugger vastly increases programming productivity.

THOROUGH TESTING — RESPONSIVE SUPPORT

You demand reliable compilers. Philon's quality assurance commitment delivers.

ACCURATE, EASY-TO-UNDERSTAND DOCUMENTATION — It's part of The Philon Approach.™ Plus, you can become part of a comprehensive customer support program designed to keep productivity at its maximum. This is what you will come to expect from Philon.

*UNIX is a trademark of AT&T Bell Labs
**RM/COBOL is a trademark of Ryan-McFarland Corp.
†CBASIC is a trademark of Digital Research, Inc.
††MBASIC is a trademark of Microsoft, Inc.

RECOMPILE EXISTING APPLICATIONS FOR DRAMATIC RESULTS

Dramatic speed improvements can be achieved by simply recompiling with one of these corresponding PHILON FAST/Compilers.

RM/COBOL**	PHILON FAST/COBOL
CBASIC†	PHILON FAST/BASIC-C
MBASIC††	PHILON FAST/BASIC-M
Any full implementation of K & R 'C'	PHILON FAST/C

BYTE Magazine Sieve Benchmark

RYAN-McFARLAND COBOL

MICRO FOCUS HIGH PERFORMANCE LEVEL II COBOL

In a comparison of Ryan-McFarland COBOL 1.6A, Micro Focus COBOL 2.0 and PHILON FAST/COBOL 1.0 using the *BYTE* Magazine sieve benchmark the results are conclusive: PHILON FAST/COBOL executes the benchmark 24 times faster than Micro Focus and 47 times faster than RM/COBOL. (System configuration: 68000/UNIX/8mHz/1wait state.)

Unleash the true potential of your 68000/UNIX system, call Bob Gildenberg at (212) 807-0303 or write to Philon, Inc., 641 Avenue of the Americas, New York, NY 10011

PHILON™

new TeleVi
TeleVideo

Service is the cross you shouldn't have to bear.

It's the first promise made.
It's the last promise kept.
But today, service may well be the most important consideration in the computer buying decision.

It may also be the best reason to choose Wang.

Wang has more than doubled its field service and support staff in the last three years.

Wang has an ongoing, two-way dialogue with customers to keep them current and to respond to their changing needs.

Wang has designed its educational programs to not only fit the needs of every company, but to fit the needs of every person involved in office automation, from top management to end-user.

In fact, the way Wang looks at it, the more help we can give our customers, the more help they'll get from our computers.

WANG

We put people in front of computers.

Europe facing marginal technological growth

By George Hanver
CW Staff

AMSTERDAM — Where is the European computer market headed?

The words and tone of Vittorio Cassoni, vice-president of corporate marketing for Olivetti S.P.A., conveyed an unmistakable pessimism about the direction of the European market to the sparse crowd attending his Comdex/Europe keynote address here recently.

"Without a development in favor of the new technologies," Cassoni said, "the decline of Europe is destined to continue. . . . Europe will not be in condition to participate with full rights in the new development cycle. It will sink to an increasingly marginal technological and economic position."

Cassoni outlined what European companies must do to stay in the running in the technological horse race now dominated by the U.S. and Japan. But at few points did he sound convinced his prescription would be followed.

Do not worry about technological and productive autonomy, he told his audience, because European firms cannot succeed by going it alone or even by uniting their own forces. Agreements with Japanese and U.S. companies must be the means to active participation in the development of new technologies, he noted.

More than 200 such agreements have been concluded, Cassoni said, but in many cases the European companies are simply passive partners operating from positions of financial and technological weakness.

Venture capital could permit the birth and growth of small companies in Europe as it has in the U.S., he added.

Discord does not permit optimism

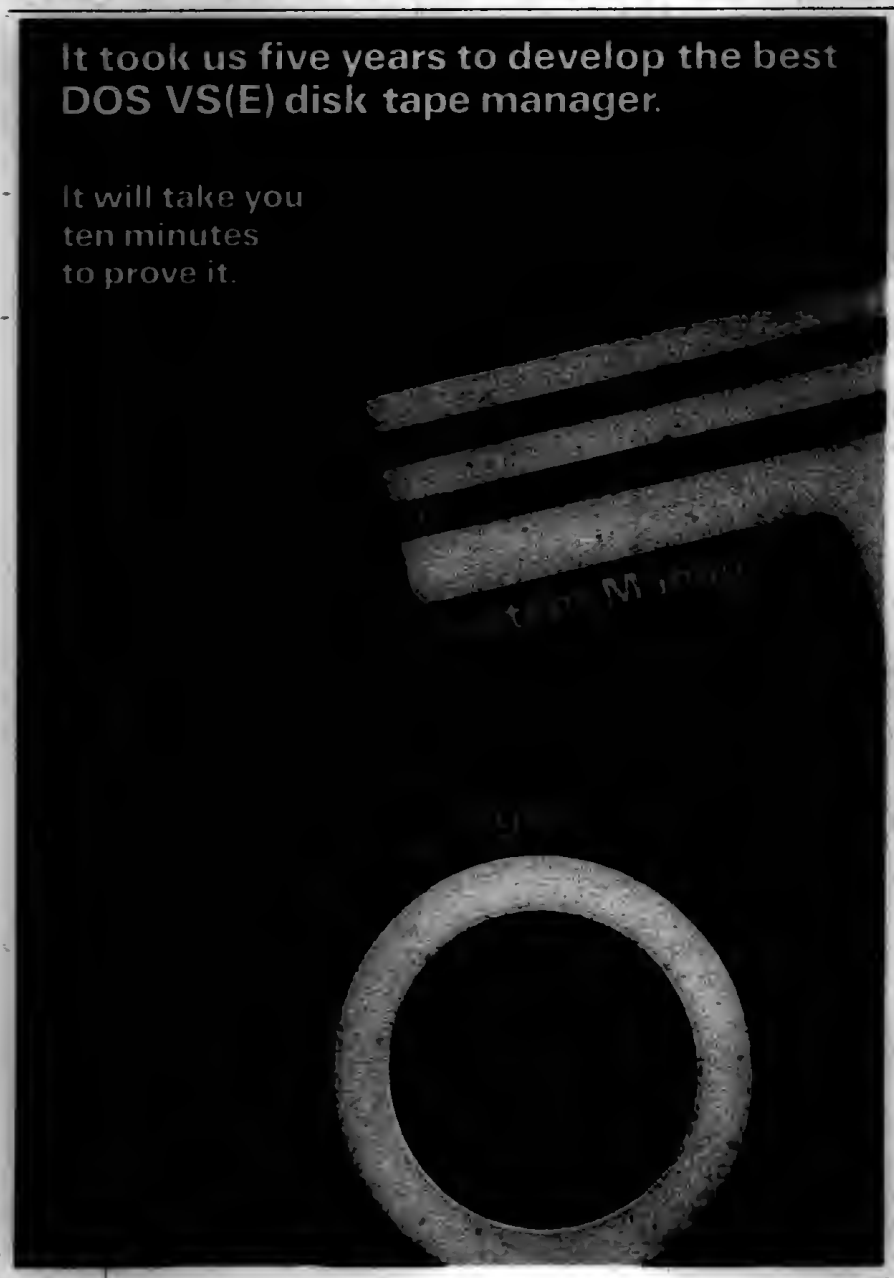
A strong home base for sales would strengthen European companies, and Cassoni called for a "more integrated and homogeneous" market. But he was bluntly realistic: "The political and economic discord that currently divides the European countries does not permit optimism on possible progress in the immediate future."

He cited figures illustrating the lack of dynamism in the European marketplace, both from user and vendor perspectives:

- At the end of 1983, an estimated one out of three U.S. white-collar workers used an office workstation, compared with one out of 12 in Europe.
- In the U.S., one in 10 white-collar workers uses a personal computer, compared with one in 30 in Europe.
- A European telecommunications company would need sales of at least $14 billion to reach typical profit levels, after an initial investment of $700 million to $1 billion to develop a new digital switch. That profitability would only be possible by the company's assuring itself of 100% of the combined digital switch markets of West Germany, Great Britain and France for the next decade.
- More than 80% of the companies controlling production in the information industry are U.S. firms, while 10% are European.

Cassoni concluded his lament about the European computer industry by describing a scenario in which Europe continues on its present course to becoming a marginal technological power. He ended by stating, "Let's hope it will not happen."

The third annual Comdex/Europe, which focused on small computer systems, had been expected to draw 10,000 visitors. The sponsor, The Interface Group, Inc., reported that 7,300 visitors attended.



Author slated to address office expo

WASHINGTON, D.C. — Tom Peters, coauthor of *In Search of Excellence*, will address the Federal Office Systems Exposition at the Convention Center here March 6.

Peters will share his findings on revitalizing corporations, continuing innovation, enhancing customer satisfaction, improving productivity and implementing strategy.

The author's research on companies has included 3M Corp., IBM, Digital Equipment Corp., Data General Corp., Hewlett-Packard Co. and Texas Instruments, Inc.

Peters first published an article in *Business Week* in July 1980 based on the findings of a survey on company excellence. The findings, published in book form by Peters and coauthor Bob Waterman in November 1982, became a best-seller.

The registration fee for the full conference is $200 by Feb. 4 and $295 thereafter.

Additional information on the conference and exposition is available from National Trade Productions, Suite 400, 2111 Eisenhower Ave., Alexandria, Va. 22314.

Now last minute presentations can be made from your personal computer. In color. In house. In minutes.

Introducing Polaroid Palette.

Whether your presentation is in 30 minutes or 30 days, the new Polaroid Palette Computer Image Recorder will make it easier. Priced at under $1800*, it lets you make Polaroid instant 35mm slides or prints from personal computer-generated data. Right at your desk. So now you can create a presentation in minutes. Without sending out for processing, paying premiums for rush service or risking the security of your confidential information.

Works with the graphics packages of the IBM PC or XT, DEC Rainbow, Apple IIe and II+ as well as other pcs.

The Polaroid Palette is designed to work with many graphics software packages. In fact, when using such popular programs as Graphwriter, Chart-Master, Sign-Master, DR Draw and DR Graph, Palette can virtually double both the horizontal and vertical resolution of your monitor. Plus, a "backfill" feature reduces raster lines for a smoother, more finished appearance. The result—presentation quality slides. On-the-spot.

Color 35mm slides, even from a black and white CRT.

Think of it as an artist's palette. Because Palette "paints" your graphs, charts and text. You're choosing from up to 72 colors. If you don't want red, press a few keys—it's green. And if you're not the artistic-type, Polaroid has developed a menu of color sets: combinations of colors that have been specially coordinated to complement your presentations. And all of this is yours, even if you have a black and white monitor.

Lets you make last minute changes or add up-to-the-minute information.

The Polaroid Palette is the fast, convenient, low-cost way to prepare slides for your presentation. And perhaps even more important, Palette allows you to keep confidential information confidential. You won't have to send your work out to anyone again.

So why wait until the last minute to find out about Polaroid Palette? Call this toll-free number or return this coupon. Because with Palette you'll make your deadlines, in no time.

For a demonstration, call toll-free, or mail the coupon to Polaroid Corp., E.I. Marketing, Dept. 605 575 Technology Sq., Cambridge, MA 02139.

CALL 1-800-225-1618

☐ Send information. ☐ Have representative call. CIM-11/85

Name _____ Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Telephone (_____) _____

PC make and model _____

Polaroid

*Suggested list price. Polaroid®

NEWS

INTERNATIONAL REPORT
CW International News Network

CHINA

BEIJING — China will adopt more flexible policies toward foreign investment, State Councillor Gu Mu said at a recent investment symposium here. The councillor said the government was currently considering cutting income taxes for all enterprises using foreign capital. Preferential treatment would be given to foreign start-ups, and the old 30-year time limit could be extended for projects with heavy investments and long gestation periods. He also said the country would allow high-tech products to be sold in its formerly closed market in exchange for the advanced technology that China needs.

ENGLAND

LONDON — British Telecom is reportedly running into trouble with its Kilostream digital network, which is intended to provide business users with inexpensive private digital circuits. After the system was installed in several major companies, it was discovered that local exchanges were found not to be equipped with the necessary multiplexers to handle Kilostream communications.

FRANCE

PARIS — Matra Informatique, the French aerospace group, has joined forces with the Norwegian minicomputer maker Norsk Data A.S. (ND), to research and develop superminicomputer technology cooperatively. The two companies will be jointly working on new products, including a Cmos large-scale integration version of the ND 500 and a 32-bit workstation based on ND technology. Matra will control a French subsidiary of ND, which will manufacture and market the ND 500 supermini family in France in 1985.

JAPAN

TOKYO — Hitachi, Ltd. has developed a man-machine interface that reportedly can handle handwritten input. According to the vendor, the user writes on the display in much the same way he writes on paper, and the system matches the characters to its character set: 2,300 Kanji, Hiragana and Katakana characters, the English alphabet and numbers. The product is expected to come to market next year.

MEXICO

MEXICO CITY — IBM reportedly intends to open a major personal computer manufacturing facility here. If approved next month by Mexico's National Commission on Foreign Investments, the plan would enable IBM to become the first foreign micro maker to establish business here without giving up a majority interest to a Mexican partner. The Mexican government recently said it would allow a foreign firm to exert majority control in a Mexican company, provided the firm created a significant number of jobs, produced an exportable product and brought new technology to the country.

THE NETHERLANDS

AMSTERDAM — Prices on some 800 IBM software products here will be raised as of Jan. 1, according to IBM Netherlands. The average price hike will be 10%, although prices on some products, including the vendor's Information MVS, the OS/VS version of ACT/Vtam and the Data Base/Data Communication Data Dictionary, will jump 20%. In addition, license fees on VM/SP, VSE/Vsam, CICS under DOS/VSE and Sequel/DS will increase by 15%, an IBM spokesman said.

USSR

MOSCOW — The USSR reportedly has agreed to sell its first-ever supercomputer for export to India, with a delivery date slated for early next year. The only information known about the machine is its $20 million price tag, which places it in the same category as the Cray 2 from Cray Research, Inc.

The machine is thought to be an advanced version of the 200-million-floating-point-operations-per-second (Mflop) parallel processor shown at the Leipzig, East Germany, fair earlier this year. The Soviet supercomputer is understood to perform between 400 and 600 Mflops, sources said.

The supercomputer is said to be part of a larger deal with India, a country with which the U.S. has refused to do high-tech business because of the U.S. belief that the computers will be used for India's nuclear defense program.

WEST GERMANY

MUNICH — At the recent Integrated Telecommunications Congress here, German Postal Telephone and Telegraph (PTT) Minister Christian Schwarz-Schilling presented the PTT's plan for an Integrated Services Digital Network (ISDN).

The scheme calls for an influx of roughly $300 million a year to digitize existing networks by 1988. The German PTT is anticipating between four million and five million participants in its ISDN by 1990.

Forte introduces

NEWS

TURNAROUND TIME
Larry Long

Q During the last 25 years, I've advanced to a position of MIS responsibility with more than 100 people under me. I enjoy my job and would love to continue to advance within the company. But, there is literally no room.

Given this situation, I released my name to a search firm that got me an interview and a job offer.

Here is the problem. I could stay here and perhaps stagnate in my current position or, if I am promoted, I would most likely end up with about double the responsibility of my current job. If I took the job [offered by the search firm], I would be No. 1 in MIS in a much smaller company. If I leave the company, and if tradition prevails, I would have no opportunity to return to my present company. If I remain in my present position, I may have a one in four chance at the top slot but not in the near future. Any insight would be appreciated.

I could never recommend that someone wait for career opportunities to happen. Fast burners create their own opportunities, then take advantage of them. You could spend the remainder of your career waiting. Do you want a new challenge or do you want to wait?

Q A manager in another department purchased a couple of micros about a year ago, and he has been very successful in applying them to his department's needs. His success has gained a lot visibility for him and his department throughout the company. Their success is the impetus behind a decision to buy 40 microcomputers for distribution to other departments. My department, information systems, has been placed in charge of the evaluation, selection, acquisition and implementation process.

In a recent meeting, many of the managers expressed an interest in purchasing portable micros so they can work at home. Most of them have no experience with desktops micros. Do you think it is advisable to purchase portable rather than desktop micros?

I'm assuming that you are referring to portables, the lap variety, rather than the transportables. I define a transportable as a micro that can be packaged for movement and weighs about 30 lb. Practically speaking, these are a little heavy for frequent movement between home and office.

On the other hand, lap micros are so portable that they invite managers to include them with other briefcase items. Several available lap computers are at least as powerful as most desktop micros. The complaints that I have heard stem from the limitations of the liquid crystal flat panel display.

I would recommend that you select a compatible desktop and portable, detail the trade-offs, demonstrate the use of each and encourage the managers to spend at least an hour interacting with each system. Then, let them make the choice.

Given that your managers understand the trade-offs, I would expect that only those who truly need portability will opt for portable micros.

Q I manage a small customer service group whose primary functions are order entry and responding to customer inquiries. The information for most customer inquiries is not readily available, so we normally call back the next day.

I came to the conclusion that our company is technologically obsolete in DP and is going nowhere, so we decided to order a small computer with six workstations and implement our own system. The system will enable us to be more responsive to our customers. The disadvantage of the proposed system is that it will overlap with existing processing and result in some duplicate data entry, but the benefits seem greater than the costs. Our DP manager thinks we are wasting time and money, yet he offers no solution to our problems. Do you think we should wait on DP or proceed with our plans?

Information systems progress is not necessarily a function of state-of-the-art knowledge. As I talk with successful MIS and user managers, I am becoming more convinced that cooperation and willingness to learn are more important than keeping pace with the technology. Having your own system may be the answer, but before you create an essentially autonomous system, I would reestablish a dialog and an attitude of cooperation with the DP manager. Hopefully, your manager will reciprocate.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, P.O. Box 880, Framingham, Mass. 01701.

disk
the smarter desk

You've read about the IBM® 3270 PC. Now there's a technology that gives your existing PCs and compatibles IBM 3270 PC emulation. And more.

You can run all this concurrently: an IBM DOS session, mainframe sessions with four different hosts, and two note-pad sessions. Like IBM's machine, your PCs will do windows. You can even transfer data between windows. Save your work on diskettes. Then upload to the mainframe.

Unlike IBM's system, the Forte 3270PC™ emulator is entirely soft-loaded from diskette. With high-powered, menu-driven software. You can reconfigure the keyboard and change screen colors or highlighting at will. For upgrades, you don't replace any PROMs. Just plunk in a different diskette.

With Forte, you won't get stuck with an obsolete or impossible-to-upgrade product. In fact, if you already own Forte PJ,™ just call your local distributor for a fast upgrade to the Forte 3270 PC on disk.

We're faster than IBM, too. With local screen capture. Transfer of whole files instead of single screens.

So before investing in a "smart desk," see how Forte can transform the PCs you already have into something even smarter.

FORTE

THE FORCE IN MICRO TO MAINFRAME COMMUNICATIONS

2205 Fortune Drive, San Jose, CA 95131 (408) 945-9111 Telex 275973 TOLL-FREE HOTLINE (800) 233-3278

Micros topic of conference

SAN FRANCISCO — The National Institute for Management Research is sponsoring a three-day conference entitled "Financial Information Systems — Integrating Personal Computers," Jan. 30 to Feb. 1 here. The conference will be held at the Sheraton Palace Hotel.

Registration is $595. For three or more attendees, the fee is $295 for the third and subsequent registrants.

More information is available from the National Institute for Management Research, which is located at P.O. Box 3727, Santa Monica, Calif. 90403.

Knight-Ridder tailors software to its needs

CHARLOTTE, N.C. — The data center staff of a newspaper publishing company here needed no help from reporters to dig up the hard-nosed facts about user access.

When users get on-line access to data through micros, workstations and distributed processing, data processing gets headaches trying to maintain security, according to Mike Presley, software support analyst for Knight Publishing Co.

"When you start supporting all of these tasks," Presley said, "you start exposing your system and data to all sorts of outside influences. This can be a little unnerving to a long-time DP manager. If you have a path to the outside world, you have a security risk. There is no way you can get around that simple fact."

Besides acknowledging this threat from outside on-line access, Knight recognized the possibility of unauthorized inside use. "A programmer can easily access sensitive files, like personnel or payroll, by simply submitting a batch job," according to David Orbaugh, director of Knight's advanced systems division.

When the firm decided to purchase a security system, it chose to pursue security through software rather than hardware, Presley said. The firm found hardware components such as performance monitors and automatic dial-back systems — with their related connect charges — too expensive to buy and maintain. "To obtain the security we needed by going the hardware route would have been prohibitively expensive," he said.

Knight looked for a software package that could protect data from breaches through either its on-line CICS facility or its batch system. "We look upon our data as an important company asset," Orbaugh said. "Any threat to its integrity is a major concern, so it seemed to be inappropriate to invest time and money in a security system that didn't protect both batch and CICS jobs."

Guidelines from a corporate auditor on the protection of resources, data files, batch partitions, programs and other data assets led Orbaugh toward a software security package, CA-Sentinel from Computer Associates International, Inc. "Everything that our corporate auditor had expressed concern about was included in the facilities of CA-Sentinel," Orbaugh said.

He brought the package to the attention of his division, and the division convinced the company's management to purchase the package. "We strongly recommended the system," he said, "because what we had seen up to then only included on-line protection. CA-Sentinel protects the entire system."

The data center at Knight, one of the South's largest publishing companies, is responsible for maintaining all of the company's business information. Knight, which is a subsidiary of Knight-Ridder Newspapers, Inc., publishes two papers, the *Charlotte Observer* and the *Charlotte News*, with a combined weekly circulation of 500,000.

Data center services

Services the data center performs include general accounting jobs along with advertising, marketing, customer service and distribution applications. The center operates two 4Mbyte IBM 4341 Model 1 CPUs under DOS/VSE, with CICS/VS as its primary on-line facility. One remote terminal, used by Knight's circulation department, accesses the system.

Presley said CA-Sentinel secures information in one of two ways.

- Through data restraints. When a person attempts to access data, the software looks for identifiers on the recording media that tell the system whether the user is authorized to use the data.
- Through resource restraints. Physical resources such as terminal names and specific batch partitions can be taken off limits during any period of time.

Within these methods, the system administrator can selectively manipulate 18 security mechanisms. The package can restrict access to CICS files, programs, tasks, storage and transient data; can limit DL/1 I/O calls; and can control pseudo batch partitions within an interactive computing and control facility.

Choosing constraints

Using on-line menus that he can call up on a terminal, the system administrator chooses the constraints he wants to implement at any given time, Presley said. "The real beauty of CA-Sentinel is that we can tailor our security measures any way we want. We don't have to secure any more than we want to."

He said a DP shop must consider budgeting its security measures — protecting critical information more than less crucial data — so as to conserve valuable system resources. With the security software package, he said, "We have a nice balance between efficient data throughput and adequate data integrity."

Knight is looking into the possibility of interfacing micros to its system sometime in the future but has no firm plans right now, Orbaugh said.

Only Texas Instruments packs more portable terminal into less space.

Here's a brief case for the Texas Instruments *Silent 700*™ Model 707 Portable Data Terminal.
It's the lean and lightest in a long line of standard-setting *Silent 700*™ terminals. And it's the most versatile full-function portable anyone can pack into a briefcase.

By carrying TI's Model 745 one step further, we made the best even better. The 707's standard internal modem connects to any telephone network while the optional acoustic coupler and battery pack make it fully portable. The spreadsheet size 132-column printer is now standard. And TI's solid state plug-in cartridges can add functions for your current use and later expansion.

For the standard-setting terminal that packs more product into less space, get the TI Model 707. At only six pounds, it packs more full-size functions than any other portable . . . all at a surprisingly low price. For more information contact: Texas Instruments Incorporated, P.O. Box 402430, Dept. DTB-163OW Dallas, Texas 75240. Telephone 1-800-527-3500.

TEXAS INSTRUMENTS
Creating useful products and services for you.

Copyright © 1984 Texas Instruments ™ Silent 700 is a trademark of Texas Instruments Incorporated.

Standardization, training unite bank affiliates

TORRANCE, Calif. — When the nation's largest multistate bank holding company, First Interstate Bancorp, formed its data processing subsidiary in 1976, the company had DP facilities in each of its 21 affiliate banks.

"We inherited just about every brand of hardware known to man," said John Riggs, vice-president and corporate training manager of First Interstate Services, the DP affiliate that provided information processing services to the banking offices.

The challenge for First Interstate Services was first to standardize its hardware and software, then to train its users on the equipment. The equipment has since been standardized to IBM, and the DP affiliate has been organized into eight data centers nationwide staffed by 2,000 employees.

"By joining forces, DP services have improved. DP has a lot more leverage with vendors, and we've saved money by pooling resources," Riggs said.

But as DP technology spread through the banking network, DP training needs became more complex. Employees had a range of computer experience, and DP professionals needed to learn business skills. End users needed to learn how to use popular software packages and to access the bank's mainframes from more than 500 IBM Personal Computers.

In January 1983, a training department was formed within the service company's corporate structure, and Riggs went through a career change, crossing from DP to training management. He was charged with developing a companywide technical and nontechnical training program.

Program objectives

Working with senior management, Riggs outlined the following objectives for the training program:

- Offer skills training aimed at the appropriate personnel at the specific time required.
- Establish a comprehensive training resource.
- Provide uniform training to the distributed centers.
- Develop a coordinated approach to computer-based training (CBT).
- Set up a system for analyzing, monitoring and evaluating training.

The resources committed to achieving these objectives included a professional trainer, seven regional training managers, top-notch seminar presenters, skills training and management information courses from Deltak, Inc. of Naperville, Ill., and a $2 million DP training budget.

"Our biggest problem was that we often found ourselves reinventing the wheel in each regional center," Riggs said. "The quantity and quality of training varied. We needed a companywide training plan, a basic framework within which each center could work, with allowances for individual center needs and priorities."

Training needs are now identified at each regional data center. The program consists of in-house training for first-line supervisors, middle management, project management and end users; Deltak's video-based, self-paced technical and nontechnical training and its CBT for micros and mainframes; vendor-conducted hardware and software training; company-sponsored training; and outside seminars.

Technical skills training

Because the data centers are geographically dispersed and employees' needs so diverse, the technical skills training program was built around video- and computer-based training courses from Deltak. Deltak courses address a broad range of DP subjects such as MVS/SP JCL; command-level language for IBM's CICS; and Information Builders, Inc.'s Focus, a fourth-generation applications programming language.

"The main strength of Deltak's courses is that they can be delivered on-site; you don't have to take people away from their jobs," Riggs said. "As a result, we can offer ongoing technical training to our staff whenever it needs it."

As microcomputer use spread throughout the banks, end-user training became a high priority. End-user computing services and training are provided through information centers associated with four of the regional DP offices.

Infofast, the first and largest First Interstate Services information center, is located in Los Angeles. It serves more than 700 users, primarily from the First Interstate Bank of California and the corporate holding company.

For the future, more emphasis is being placed on CBT. "We track the expense of training, but we don't track the cost of time away from the job required to complete training programs. As we become more sensitive to this, we'll use more CBT," Riggs said.

The bank is also considering a technology training program for senior management. This program would focus on DP management, strategy and technology. It would also address potential upper-level-manager-reluctance to becoming part-time DP students.

BEFORE RAMIS II, THE APPLICATION PUZZLE NEVER QUITE CAME TOGETHER.

[redacted]

HOW ALL THE PIECES FIT— AND THE RESULT IS INCREASED PRODUCTIVITY

RAMIS II is a powerful software system that delivers greater productivity through all three stages of the application lifecycle. RAMIS II's ease of use allows you to develop *prototypes* quickly and efficiently.

RAMIS II

To *implement* these prototypes and produce comprehensive and reliable applications, RAMIS II offers a full range of integrated tools. And it has the flexibility to *enhance* systems so they remain current with user needs.

For the computer specialists trying to make headway against an applications logjam, RAMIS II slashes the time between initial request and finished product, letting them implement more projects and receive the benefits of each one sooner.

SEE THE NEWEST TOOLS FOR APPLICATION DEVELOPMENT AT A RAMIS II SEMINAR

With RAMIS II, you get applications development capabilities on the leading edge of technology. Like a powerful *new* transaction processing language. And a *new* high-performance compiled applications development language. Plus an elegant screen-painting feature for data management and creation of menus.

Whether you choose to develop complete 4th-generation applications, or use RAMIS II's flexible reporting and analysis functions to add new life to your existing ones, you'll want to attend a free Production Applications Seminar.

Register today for a seminar in your area. Call 1-800-257-5875 or return the coupon below. That's the first step in solving the application puzzle. The next, of course, is RAMIS II.

MATHEMATICA
P.O. Box 2392, Princeton, NJ 08540

☐ Please send me more information describing RAMIS II.
☐ Please send me a schedule of RAMIS II Seminars on Production Applications.

Name
Title
Company
City State Zip
Telephone
Computer Operating System

CW 11/26/84

MARTIN MARIETTA

RAMIS II... THE LEADER BY DESIGN

THE AT&T FAMILY OF DATASPEED

You need hardworking, multi-functional terminals dedicated to improving productivity.

AT&T Information Systems can help. We have a full line of asynchronous and synchronous data terminal products that enable you to move and manage information quickly. Products designed to get the word around.

Our DATASPEED® 4000 Terminals are engineered to get along well with people, too.

Non-glare, high-resolution, black background tilt screens, English language options, and lightweight detachable keyboards in typewriter format keep users comfortable and productive.

Features like windowing, split-screen mode, 80- or 132-column wide-screen format, and non-volatile PF keys help reduce user errors.

Conversational and editing terminals that speak for themselves.

The DATASPEED 4410, 4415, 4420 and 4430 Terminals are asynchronous desk-top workstations with superior features and functionality.

The 4410 is conversational, with graphics and sophisticated display capabilities.

If you need an editing display terminal, the 4415 is one of the most functional in its class. The 4420 is a feature-rich editing display terminal. It's especially engineered to help the nontechnical user become proficient quickly.

The 4430 is a conversational terminal for the multi-point, private line environment. There's no need for the computer to poll and address these multi-point terminals. This saves you valuable processing time.

Synchronous terminals on speaking terms with IBM.

AT&T Information Systems' DATASPEED 4540, Enhanced 4540 and 4540 Touch Screen Terminals are designed for a clustered, polled environment. All of these synchronous terminals are compact, modular and 3270 compatible.

TERMINALS. WE SPREAD THE WORD.

The 4540 and Touch Screen 4540 support SDLC/BSC line protocols. With one of our new controllers, you can upgrade to SNA by simply changing a diskette.

For SNA/SDLC compatability, there's the Enhanced 4540. It offers flexibility, introducing a choice of two controllers, standard- or reduced-sized displays and high- or low-profile keyboards.

The Touch Screen 4540 has 30 touch-sensitive areas on the screen which give you fast, easy access to information.

A history of communicating better.

AT&T led the communications revolution over 100 years ago. Our products and service set the standards for performance and reliability.

Today, 4,000 scientists from Bell Laboratories are working full time to develop and design new business products at AT&T Information Systems Laboratories. Products we continue to support by the largest, most experienced sales and service force in the industry.

Our family of DATASPEED Terminals incorporate Information Systems Architecture, the design principle that integrates our products so they perform as one system. As you grow, the flexibility of Information Systems Architecture allows for easy system expansion.

To learn how our family of DATASPEED Terminals can increase your profits and productivity, call 1-800-247-1212, Ext. 329.

WHEN YOU'VE GOT TO BE RIGHT.

AT&T Information Systems

Restaurants eliminate paperwork, lessen errors

ATLANTA, Ga. — When Arby's Inc. wanted to put the bite on errors and improve efficiency in its system of collecting payroll data, it turned to the use of small terminals with attached acoustic couplers.

The terminals, each measuring five by three inches and weighing about half a pound, allow the managers of each Arby's restaurant to send what would otherwise be a mouthful of data — their weekly payroll information — to the corporation's IBM System 38 mainframe here at the firm's headquarters.

The system, in use since January 1983, has replaced verbal reports, which had once occupied 20 operators at a service bureau, the corporation's former payroll processing site. "We ended up with a 25% error rate with people transposing figures" under the previous system, recalled Bill Needham, manager of Arby's point-of-sale system.

The terminals are part of a data collection system called Toes, from Interface Technology, Inc. Each week, they are used to upload payroll information to an IBM Series/1 minicomputer, which creates data files and passes them on to the mainframe for later processing. Needham said Arby's was largely pleased with the terminals, called Port-a-Store units, though he found them "very sensitive to telephone line problems" and would like them to come equipped with automatic shut-off switches.

Without the auto-off switch, Needham said, managers are likely to leave the unit on accidentally. "We get eight to ten calls a week saying 'what's wrong with it,' and the battery is usually dead," he said.

The terminals allow restaurant managers to enter payroll data (employee number, rate code, hours worked) into the Port-A-Store at their convenience, check it for accuracy, correct mistakes and add or delete lines. When the manager is sure the data is accurate, he calls the Toes computer at Arby's headquarters. An electronic voice answers with, "Hello, this is Arby-Net, please enter unit number and security code."

The manager positions the terminal to the first line, attaches it to the telephone mouthpiece and presses the transmit button. The terminal transmits the unit number and security code using Touch-Tone signals and the computer checks the code and prompts the manager for the next information.

The Toes voice repeats each entry before it prompts for the next line so the manager can check for accuracy. It also reportedly informs the manager of any errors and allows him to cancel lines and make any changes before they sign off.

The benefits of the Toes system have included a reduction of three or four minutes in the amount of time managers spend transmitting the payroll data — it had taken them as much as a half hour previously — and a reduction in errors, Needham said. In addition, the Arby's MIS department reportedly can generate a report showing which restaurants have not yet entered payroll data for the current period. This is said to expedite the collection of late reports and promote efficient closing of the pay period. The number of calls made by each restaurant and the time spent on each call can also be monitored, enabling problems to be isolated quickly.

In December 1983, Arby's added coupon sales and product sales reports to the Toes system. These reporting applications give Arby's the latest sales information. Each coupon promotion can be evaluated almost immediately from coupon sales reports, whereas before it took several weeks to gather information, compile it and then analyze the effectiveness of each promotion.

General DataComm beats Hayes for accuracy.

NEWS

Supplier boosts output with electronic printer

WICKLIFFE, Ohio — Two years after it switched to an electronic printing system, Bailey Controls Co., a process industry supplier based here, found it was saving $64,000 in paper and printing costs annually. It is also getting more printing done and getting it done faster, according to DP operations manager Leonard Bruno.

One of the biggest cost savings for Bailey, Bruno said, was derived from the 9700 printer's ability to print in duplex, using both sides of a sheet of paper. "We figure we save between $2,500 and $3,000 each month in paper costs alone, simply by printing in duplex," explains Bruno. "Our original goal was to print 75% of our output in duplex. Now, it's been so successful that we're at about 90% duplex printing."

Bailey's savings in paper costs, however, were not due entirely to the acquisition of the new printer, Bruno noted, but also occurred because of the firm's war on paper waste — which saved it $42,000 and cut paper use by 20%. The firm designs, manufacturers and markets high-technology instrumentation and control systems.

Prior to leasing the Xerox Corp. 9700 electronic printer, Bailey's NAS 6650 computer, running under an MVS 3.8 operating system, was generating some 1.5 million pages of output every month, supplying the company with documents ranging from proposals for customers to time-critical daily inventory and order processing reports for manufacturing, according to Bruno.

To keep up with the heavy demand, Bruno said, two Xerox 1200 series nonimpact printers ran almost around the clock, and overtime costs averaged $500 per month.

The 9700 printer handles between 500 and 600 jobs daily, Bruno said, and has allowed the firm to increase its accuracy in meeting printing schedules from a little over 99% to 99.8% — with less than 2% downtime. "It used to take us two whole shifts to print all our reports," Bruno noted. "With the 9700 printer, we finish in plenty of time, and we can get more out if necessary. If we run into a problem, the speed of the 9700 allows us to recover and still meet our deadline."

The company runs the 9700 printer on-line, printing on plain 8½- by 11-in. paper at up to 120 pages per minute.

The computer-controlled printer uses xerographic printing, under which a laser beam creates images on a photoreceptor belt and the images are transferred to paper. The 9700 prints numbers, text, logos and forms.

Bailey's printing manpower requirements have also been reduced, saving $23,000 yearly, Bruno said.

Now, he said, only one operator is needed to monitor the laser printer during its heaviest use, and less operator handling is required because reloading toner and developer is easier, and "fixing the jam . . . is twice as fast because the machine tells you exactly where to look."

And we can prove it.

We put our 212 modem to the critical test. We stacked it up against Hayes, one of the "smart" modems.

The Performance

Hundreds of phone calls were carefully monitored, analyzed, and verified by telecommunications engineers. After exhaustive testing, the results were conclusive: when line quality was average, our modem was one and a half times more accurate than Hayes. When line quality was bad, however, our modem was up to ten times more accurate. And when line quality was really bad, their error rate shot up to as much as 100 times ours! The errors ranged from misspelled words to incorrect numbers. The implications for modem business are understandably serious.

The Reliability

Then we went inside and did a component count. The final score: Hayes 252, us 155. This can be viewed two ways: Either Hayes has a 60% better chance of developing part failure, or our modem has a 60% better chance of delivering higher reliability.

Eliminating operator risk is as important to us as eliminating errors. With our modem there's virtually no risk of electrical damage because there are no internal switches to deal with. General DataComm modems automatically select all call parameters.

The Company

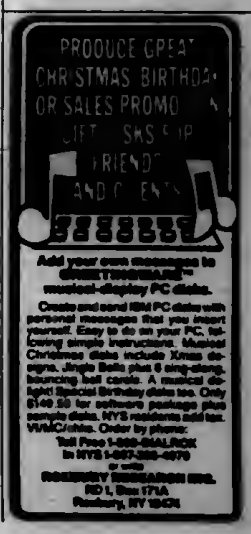
The General DataComm intelligent modem is the newest product of a company that has been designing data communication systems for 15 years. A company whose customer list is a "Who's Who" of international business. Most of the Bell operating companies, and other telephone companies in the U.S. and Canada. Major banks. Brokerage firms. And many of the Fortune "500."

We build multiplexers, modems, local area and digital network products, and the most complete networking systems on the market. Now we're applying the technology that won the respect of big business and Bell to the personal computer market. With a line of 300 and 1200 bps modems and our own communications software.

The General DataComm modem. We put it to the critical test. Now it's ready for the ultimate test. Yours. To find the dealer nearest you, contact the Personal Computer Products Dept., (203) 574-1118. General DataComm Industries, Inc., Middlebury, CT 06762-1299.

general dataComm

The best connections in the business.



Add your own messages to musical-display PC disks.

Create and send IBM PC disks with personal messages that you insert yourself. Easy to do on your PC, following simple instructions. Musical Christmas disks include Xmas designs, jingle Bells plus 6 sing-along, bouncing ball cards. A musical delight! Special Birthday disks too. Only $140.00 for software package plus sample disks. NYS residents add tax. VISA/Cards. Order by phone:

Toll Free 1-800-DIALROX
In NYS 1-607-356-4970
or write
ROSEBERRY RESEARCH INC.
RD 1, Box 171A
Roseberry, NY 13421

Tool aids firm's DOS-to-MVS conversion

SOUTH BRUNSWICK, N.J. — When business operations at Dow Jones & Co.'s Computer Service Facility were reaching peak load last year, the company decided to change operating systems, hoping to streamline maintenance. But managing the conversion was not an easy task.

In 20 years, Dow Jones has gone from using batch systems running on the backup computer for a typesetting/message-switching system to an on-line system using approximately 300 terminals in 23 locations operating on three IBM 4331 Model Group 2 machines under DOS/VSE.

Handling a data storage increase of approximately 25% a year, in January 1983, the Computer Service Facility business staff consisted of 30 programmers, 22 operations people running three shifts 24 hours a day and 12 technical services people. With more than 25 systems and approximately 2,000 programs, the group was using 84 volumes of data, each with a capacity for storing 317 million characters. The site was rapidly becoming a large and complex environment requiring many DOS/VSE systems.

"It was time to stop and reevaluate our environment," said Jim Golis, systems project leader. "We were on the verge of becoming bogged down in sheer complexity. A conversion to MVS was a sensible alternative."

With that in mind, in January 1983, a project team representing the business areas of the Computer Service Facility was formed to research the possibility of converting from DOS to MVS. By spring, the group presented a conversion proposal to management.

The proposal included an inventory and evaluation of the current system environment, company growth projections, a detailed report on the business system, an implementation plan and breakdown of responsibilities throughout the conversion, estimated costs and cost justification. In June, the project team got the go-ahead.

An effective conversion tool

"One of the first things we knew we needed was an effective conversion tool for both JCL and Cobol source code," Golis stated. After examining the marketplace, Golis chose three systems to evaluate — IBM's conversion aids, Uccel Corp.'s Duo and Focus and a product developed by Arkay Computer, Inc. of Newton Centre, Mass. Arkay Computer was recently acquired by Computer Associates International, Inc., and Focus is now marketed under the name CA-Convertor.

Golis established a list of the requirements he expected to be filled by a conversion tool. "First of all, you want the conversion tool to do as much of the work as possible," Golis explained. "Conversions require minute attention to detail. . . . To experience hands-on training, you want your programmers to be involved in the process, but you have to reduce the amount of repetitious work and keep them challenged and motivated.

"Next," he added, "the conversion tool has to reflect and interface with your software and methodologies. Dow Jones has a mix of software products from a variety of vendors. You need a tool that will be compatible and function with the code of all those vendors. In addition, the package must be compatible with the standards and naming conventions at your site.

"The conversion package should also be able to monitor the conversion process," Golis continued. "It should report on progress — what has been converted and what has not. It should provide an inventory and cross-reference information on files, programs and jobs."

Maintenence, ease of installation and documentation as well as cost were also considered. Golis then set up a table and evaluated each of the three products on a scale of one to 10.

"CA-Convertor was the clear leader," Golis said. "It does the majority of work for us, and only exceptions are handled on a manual basis. This helps in the training process, for example, and also allows our staff to become actively involved at a nontedious level. CA-Convertor reads the DOS source code, gives us a list of the OS code and creates an OS member directly in our source statement library.

"If there are exceptions, CA-Convertor shows us the lines of code [and] indicates what it did to correct them. We review the correction, and 95% of the time, it will compile."

Dow Jones' Computer Service Facility runs the conversion software during the day "just like another job," Golis said. "I would say it's the equivalent of about a quarter of a compile in runtime," he added.

CA-Convertor has interfaced with the vendor-supplied software at Dow Jones, according to Golis. "It has also helped us maintain our standards. With CA-Convertor, we provide the unit names we're using and the [direct-access storage device] information, and it sets up the space characteristics we want. It also sets up the OS data set names according to standards. If we were doing the

See CONVERT page 55

Accounting system aids firm's vendor payments

TORONTO — A corporation with 20 operating companies and a booming business cannot afford to stick to outdated methods of paying vendors.

Rogers Cablesystems, Inc., headquartered in Toronto, is a multiple cable system operator that serves nearly two million subscribers in Canada and the U.S. Until 1983, Rogers processed 2,500 invoices a month — payments from its 20 operating companies to more than 63,000 vendors — on an internally developed batch system, said Bruce McBurnie, manager of applications support.

In 1980, corporate executives decided to shop for an accounts payable software package that would allow all of its divisions to enter their data on-line, McBurnie said. The executives also wanted better control of charges to account numbers, he said. Major enhancements to the existing batch system were ruled out, since they would cost more than buying a new accounts payable package, he added.

Rogers selected the MSA Accounts Payable System from Management Science America, Inc. of Atlanta and had the system up and running by January 1983, according to McBurnie. Similar packages that the company looked at were not offered on-line at the time or were not on the market long enough to have been proven effective, he said.

The company now has one central processing location in Toronto for the Accounts Payable System that runs on two IBM 4381 computers under IBM's DOS/VSE operating system. The operating companies in Canada and the U.S. communicate via dedicated lines using IBM's 3278 remote terminals, McBurnie said.

Easier to spot problems

The new system has made the accounts payable process much more efficient, according to McBurnie. It is easier to spot problems and fix them immediately, he said. Vendors who call for information can get it quickly, instead of being put on hold while people search through file cabinets, he added.

All divisional reports go back through remote spooling and print at the remote location, McBurnie said. Many of the system's criteria have been standardized for all Rogers divisions by the corporate managers, he said. Options, however, are at the discretion of each division's management.

Many divisions use the system's recurring invoice feature for standard payments, McBurnie said. Once a contractual payment has been entered into the system, the computer takes over, eliminating the need for manual entry every month, he said.

Rogers' Toronto division sets up automatic payment dates and discount dates with terms of 2%, 10 days; net 30, McBurnie said. If the invoice clears the internal approval process on time, the system takes the discount automatically, he added.

Pauline Vancott, supervisor of accounts payable for Rogers' largest cable division, said, "If an error occurs, it flashes on the screen as we're working, and we can balance it immediately on-line." Some of the operating companies were using manual procedures before, and the new system saves hours of work at month-end, according to Vancott.

CONVERT from page 54

conversion manually, we would be faced with a collage of different styles of coding from the various members of the conversion team. Now we're getting good, consistent code that reflects our standards."

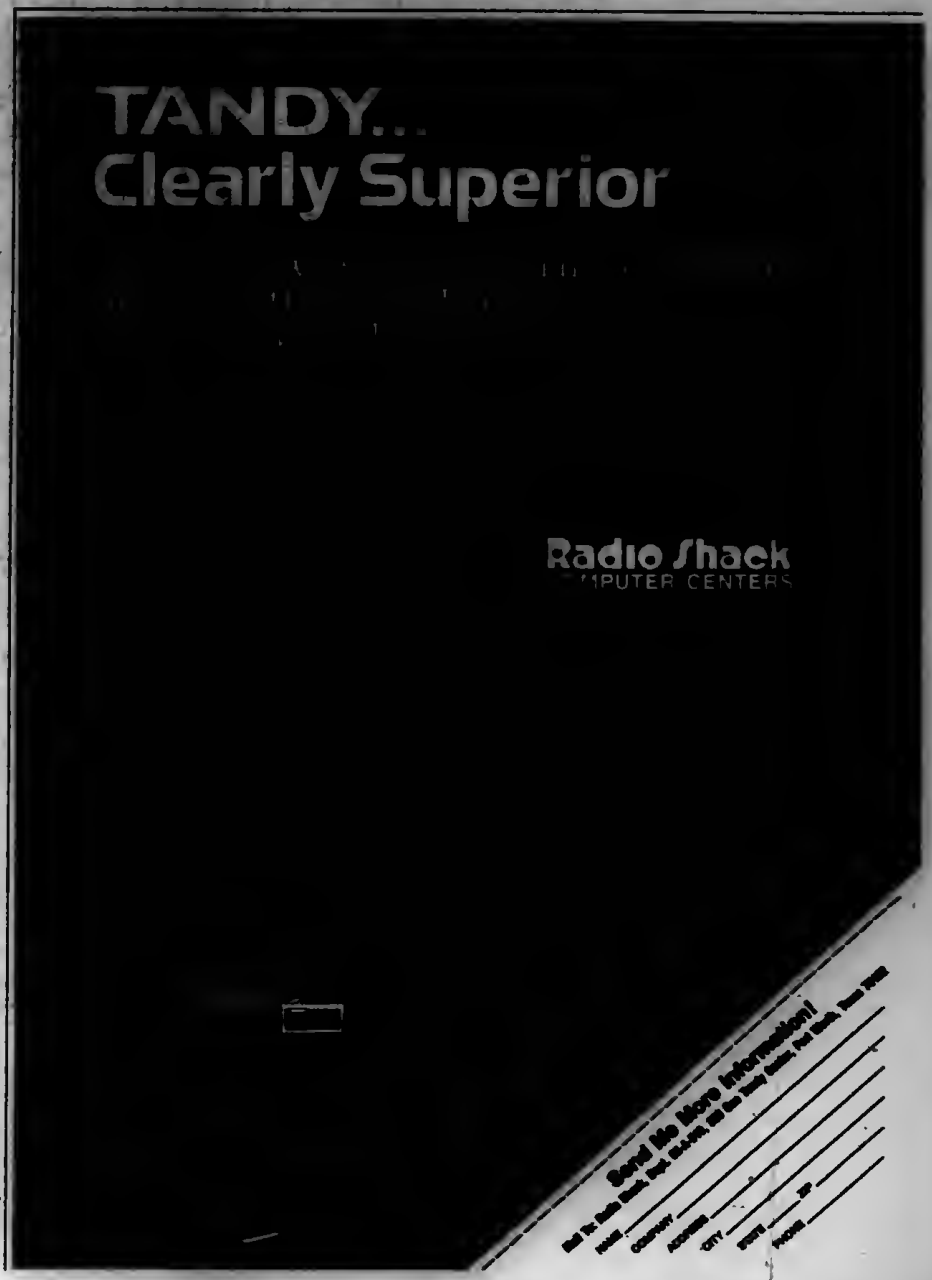
A conversion manager, the monitoring component of CA-Convertor, has helped Golis stay apprised of the progress of the project. Instead of talking individually to each member of the team, he can go to the conversion manager for a report of what has been converted and what still has to be done.

According to Golis, keeping management and the end users informed is one of the keys to a successful conversion. He holds weekly meetings with the conversion team and publishes the minutes of those meetings. He documents the results of the conversion for his end users.

For instance, Golis explained, "We ran a billing run for one of our systems which used to take 17 hours in DOS. It now takes less than eight hours. Visible results like this and the faster CICS response time have helped us get the maximum amount of cooperation from our users when we've had to freeze a system."

After management had approved the project and at the same time evaluated the conversion tools, Dow Jones installed a complete MVS system on an IBM 4341 to get the project under way. A conversion plan was also established by application and schedule dates.

"A DOS-to-MVS conversion has to be delicately orchestrated," Golis explained. "Here at Dow Jones, we were faced with 2,000 programs and 2 million lines of code to convert. One year into the project with the help of CA-Convertor, we are still on schedule in both time and cost areas.



NEWS

CALENDAR

WEEK OF DEC. 2

DECEMBER 3-4, TULSA, OKLA. — **Managing Information Centers Effectively.** Contact: Thomas J. Bisacquino, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

DECEMBER 3-4, HARTFORD, CONN. — **IMS/VS Data Communications Programming.** Contact: Don Florek, The Hartford Graduate Center, 275 Windsor St., Hartford, Conn. 06120.

DECEMBER 3-4, TIMONIUM, MD. — **Construction Cost Estimating and Control.** Contact: Center for Management Development, University of Maryland, College Park, Md. 20742.

DECEMBER 3-4, SAN JOSE, CALIF. — **Operating Systems: A Comparative Analysis.** Contact: Data-Tech Institute, P.O. Box 569, 386 Franklin Ave., Nutley, N.J. 07110.

DECEMBER 3-4, COLUMBIA, MD. — **Local-Area Networks.** Contact: Center for Management Development, University of Maryland, College Park, Md. 20742.

DECEMBER 3-4, NEW YORK — **Successful Integration of Micro and Mainframe: The System Architecture.** Contact: Grumman Data Systems Institute, Center for Professional Development, 250 Crossways Park Drive, Woodbury, N.Y. 11797.

DECEMBER 3-4, CHICAGO — **Local-Area Networks.** Contact: Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

DECEMBER 3-4, ORLANDO, FLA. — **How to Manage Data and Information as a Resource.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

DECEMBER 3-4, WASHINGTON, D.C. — **Personal Computer Communication Systems.** Contact: Architecture Technology Corp., P.O. Box 24344, Minneapolis, Minn. 55424.

DECEMBER 3-4, FORT LAUDERDALE, FLA. — **Discovering Lotus 1-2-3.** Contact: Data-Tech Institute, P.O. Box 569, 386 Franklin Ave., Nutley, N.J. 07110.

DECEMBER 3-5, BOSTON — **Controlling Software Projects.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

DECEMBER 3-5, NEW YORK — **Backup Network Planning.** Contact: EDP Security, Inc., 181 West St., Waltham, Mass. 02154.

DECEMBER 3-5, SAN FRANCISCO — **Data Base: A Manager's Guide.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

DECEMBER 3-5, WASHINGTON, D.C. — **Telecommunications Alternatives in the '80s.** Contact: Continuing Engineering Education, School of Engineering and Applied Science, George Washington University, Washington, D.C. 20052.

DECEMBER 3-5, WASHINGTON, D.C. — **Relational Data Base.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

DECEMBER 3-5, CHARLOTTE, N.C. — **Systems Project Management.** Contact: Thomas Bisacquino, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

DECEMBER 3-5, WASHINGTON, D.C. — **National Conference on Government ADP and Telecommunication Acquisition Management.** Contact: Conference Manager, U.S. Professional Development Institute, 1620 Elton Road, Silver Spring, Md. 20903.

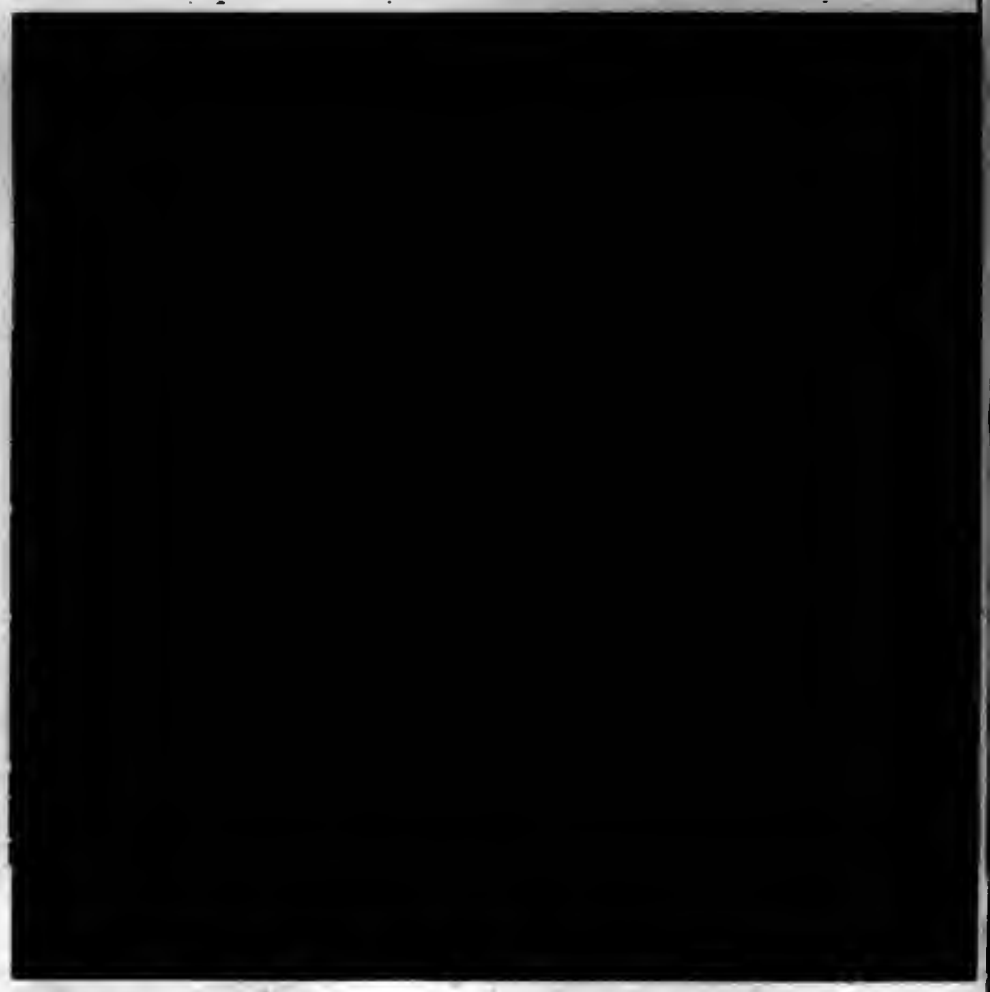
DECEMBER 3-5, NEW YORK — **EDP Disaster Recovery Seminar.** Contact: EDP Security, Inc., 181 West St., Waltham, Mass. 02154.

DECEMBER 3-5, BOSTON — **Conference on Control, Audit & Security of Digital Equipment Corp. Systems.** Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

DECEMBER 3-5, ORLANDO, FLA. — **ADS/On-Line Workshop.** Contact: Harris Education Center, Suite 507, 6220 S. Orange Blossom Trail, Orlando, Fla. 32809.

DECEMBER 3-6, PORTLAND, ORE. — **Structured Analysis and Systems Architecture Seminar/Workshop.** Contact: Jane Crosswhite, Oberland Associates, 4036 N.E. Sandy Blvd., Portland, Ore. 97212.

DECEMBER 3-7, ORLAN-



DON'T TAKE ON ANOTHER SMALL COMPUTER WITHOUT LOOKING AT THE BIG PICTURE.

And when you look at the big picture, you see more of what you're looking for in the NCR PC.

Beautiful graphics are just the beginning: It outpaces industry standard hardware with standard features like 128K RAM and both parallel and serial ports.

And we don't just give you a keyboard, we give you a keyboard with special enhancements that make it easier to work with spreadsheets and databases.

We're a soft touch when it comes to software, too. The NCR PC not only comes with NCR-DOS (our compatible operating system) and GW™-BASIC. On-line HELP is standard, too. NCR PAL, designed to introduce beginners to computing through sound and animation, is standard. And NCR TUTOR,

NEWS

DO, FLA. — **CICS Programming Workshop.** Contact: Steve Withrow, Harris Education Center, Suite 507, 6220 S. Orange Blossom Trail, Orlando, Fla. 32809.

DECEMBER 3-7, ORLANDO, FLA. — **Managerial Tools for Decision Making.** Contact: West Virginia University Research and Training Center, Suite E, 1 Dunbar Plaza, Dunbar, W. Va. 25064.

DECEMBER 3-7, HARTFORD, CONN. — **ANS Cobol Coding Techniques and File Applications II.** Contact: Don Florek, The Hartford Graduate Center, 275 Windsor St., Hartford, Conn. 06120.

DECEMBER 3-7, DALLAS — **Marketing and Employer Development.** Contact: West Virginia University Research and Training Center, Suite E, 1 Dunbar Plaza, Dunbar, W. Va. 25064.

DECEMBER 3-7, HARTFORD, CONN. — **OS/VS Job Control Language & Utilities.** Contact: Don Florek, The Hartford Graduate Center, 275 Windsor St., Hartford, Conn. 06120.

DECEMBER 3-7, CHICAGO — **CICS Macro-Level Programming.** Contact: David Shapiro, Synad, Inc., 35 W. 35th St., New York, N.Y. 10001.

DECEMBER 3-7, HARTFORD, CONN. — **Systems Analysis & Design Workshop.** Contact: Don Florek, The Hartford Graduate Center, 275 Windsor St., Hartford, Conn. 06120.

DECEMBER 3-7, ST. LOUIS — **SMP Maintenance.** Contact: Center for the Study of Data Processing, Campus Box 1141, Washington University, St. Louis, Mo. 63130.

DECEMBER 3-7, TORONTO — **Basic Systems Analysis.** Contact: Thomas Bisacquino, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

DECEMBER 3-7, MAUI, HAWAII — **C Programming Workshop.** Contact: Suzanne Battista, Course Manager, Plum Hall, Inc., 1 Spruce Ave., Cardiff, N.J. 08232.

DECEMBER 3-7, DES MOINES, IOWA — **Advanced Systems Analysis.** Contact: Thomas Bisacquino, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

DECEMBER 3-14, PARSIPPANY, N.J. — **ANS Cobol.** Contact: Chubb Institute, 8 Sylvan Way, Parsippany, N.J. 07054.

DECEMBER 4-6, SADDLEBROOK, N.J. — **Selecting a Local-Area Network.** Contact: Marketing Manager, Technology Concepts, Inc., Old County Road, Sudbury, Mass. 01776.

DECEMBER 4-6, LONDON — **Eighth International Online Information Meeting.** Contact: Jean Mulligan, Learned Information Ltd., Besselsleigh Road, Abingdon, Oxford, England OX13-6LG.

DECEMBER 4-6, WASHINGTON, D.C. — **Microcomputer Data Base Management Systems.** Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

DECEMBER 4-7, LOS ANGELES — **Digital Image Processing.** Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45405, 6305 Arizona Place, Los Angeles, Calif. 90045.

DECEMBER 4-7, WASHINGTON, D.C. — **The 1984 Videodisk, Optical Disk, Compact Disk Conference and Exposition.** Contact: Mark Roseman, Meckler Communications, 11 Ferry Lane W., Westport, Conn. 06880.

DECEMBER 5, COLUMBIA, MD. — **Tax Reduction Institute Seminar.** Contact: Center for Management Development, University of Maryland, College Park, Md. 20742.

DECEMBER 5-6, WASHINGTON, D.C. — **Contemporary Telecommunications Management: Trials and Tribulations of Telecommunicating in Year 1 A.D.** Contact: Marilyn Chasteen, The DMW Group, 2020 Hogback Road, Ann Arbor, Mich. 48104.

DECEMBER 5-7, BOSTON — **Office Automation and the Technology Revolution.** Contact: Data-Tech Institute, P.O. Box 560, 386 Franklin Ave., Nutley, N.J. 07110.

DECEMBER 5-7, WASHINGTON, D.C. — **Decision Support Systems on Personal Computers.** Contact: Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

DECEMBER 5-7, DENVER — **The First Conference on Artificial Intelligence Applications.** Contact: Institute of Electrical and Electronics Engineers, P.O. Box 639, Silver Spring, Md. 20901.

which interactively teaches the finer points of NCR-DOS, is standard as well.

You see, thinking of our product as a service, we think of ways to make it serve you better.

But isn't that exactly what you'd expect from the big, personal, computer company? Call us at 1-513-445-7478 to find out more. Or write to: NCR Corporation, World Headquarters, Personal Computer Division, Dayton, OH 45479.

You'll see why, when you look at the big picture, you're looking at NCR.

NCR THE BIG, PERSONAL, COMPUTER COMPANY.

EDITORIAL

Managing productivity

Imagine, if you can, working days and evenings, with a few weekends thrown in for good measure, on a project that demands the utmost of your creativity and ingenuity.

The project becomes all consuming, as original deadlines, set months before, loom increasingly unrealistically. Unforeseen glitches render portions of your work unusable, while other portions need wholesale redoing. Meanwhile, your family begins to feel the strain of your chronic absence from home. Suddenly, nothing in your life is going right.

Then, as the project finally nears completion, your boss informs you that your labors will never bear fruit — the project is to be scrapped. What's more, you and the other members of the project development team must set to work immediately on a new design plan, whose future is no more guaranteed than that of the one just thrown out the window.

Sound familiar? It is, hauntingly so, to scores of programmers. And to add insult to injury, the programmers are often the objects of blame for wasteful development projects, when the real culprit, as often as not, is poor planning at a higher level.

That a certain number of software development projects will encounter cost overruns, massive delays and millions of dollars in misspent corporate resources is to be expected, given the nature of the work.

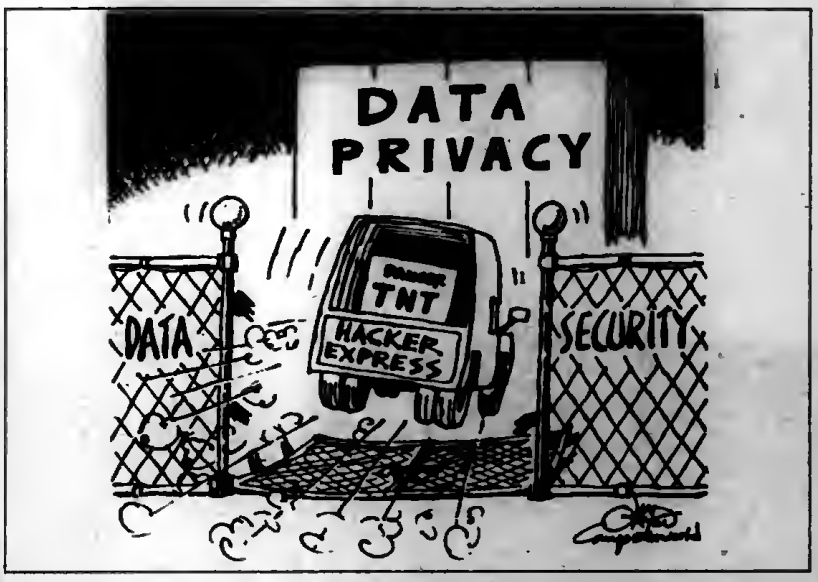
But what is disturbing is the apparent frequency of such wasteful endeavors — and their attendant costs. According to a recent survey of 200 Fortune 1,000 corporations (see page 14), one in four large system (64,000-plus lines of code) development projects now underway will be canceled. Three quarters of them will experience serious operational difficulties. The survey found further that a typical large system project today runs more than a year behind schedule and, if completed, will cost twice the original estimate.

These survey findings mirrored another recent study of programming in the corporate environment (CW, Nov. 12), a study that described programming as "labor intensive, difficult to manage, expensive and often leading to a product that is functionally deficient, unreliable and difficult to maintain." This study also labeled programmers as "not highly professional," and programming "more like a craft than a profession."

Alas, the poor programmers. They do what they are told with the tools given to them by management which hands them the project blueprint and says, "Now go and do it."

While the good news is that certain forces are at work mitigating the programmer productivity problem, DP management must heighten its awareness of what it can do to hasten the process.

- *Hire the best.* The days of rampant programmer turnover have ended, for now anyway, so there's no good reason to hire relatively inexperienced programmers for complicated tasks. Let the newcomers cut their teeth on simpler tasks, or where they can be highly supervised.
- *Take the lead in fostering software development methodologies designed to control costs and anticipate problems as early as possible in the development cycle.* This effort should be supported by serious testing of portions of the project early on.
- *Wherever possible, develop libraries of reusable code.* While some argue that too much standardization in software development can stifle innovation, it appears most shops have a way to go before reaching this stage.



LETTER

A clear case for documentation

The article "Documentation: The Time-Saver" (CW, Nov. 5) is interesting, and it makes some important points. However, it should have mentioned something about the need to have documentation organized in a contemporary style.

This is the age of high tech, where information is transmitted quickly. But documentation writers are dishing out instructions as if their audiences were pounding on a Royal Underwood.

Procedures tend to be written without regard to format or readability. Often, instructional documentation contains related information that is not pertinent. To end users, it all comes across like alphabet soup. Then [the users] must waste time [sifting] through it, trying to find what appropriate action to take. Bits and pieces of related information are excessive noise and can be cross-referenced to another section — perhaps overview — or background. Presenting the important information first, in a quick, easy to read, logical order will [promote] fast, efficient performance.

Documentation has to be presented clearly and precisely. Instructions that are easy to read and follow will save time. If documentation layout is properly presented, it will lead to quicker comprehension and faster action. This may seem like an incidental matter; but it's this and the other incidentals that put food on the table.

Timothy J. Lair
Spokane, Wash.

COMPUTERWORLD

Donald E. Fagan
Publisher

Editor
John C. Wilmarsh

Executive Editor
Rita Shaor

Managing Editor
Bill Laberis

Assistant Managing Editor
Donovan White

Senior Editors:
Software
Paul Gillin
Communications
John Dix
Systems
Tom Henkel
Microcomputers
Eric Bender
Industry
Peter Bartolik
Features
George Hamer
Design Editor
Maryore Magowan
International Editor
Susan Blakeney
Associate Features Editor
Barbara Van Scoyoc
Assistant Features Editor
Elizabeth Morse
Special Reports Editor
Janet Fiderio

Assistant Special Reports Editor
Becky Batcha
Senior Writer
John Gallant
Staff Writers:
James Connolly
John Desmond
Paul Korzeniowski
Maura McEnaney
David Olmos
Donna Raimondi
Edward Warner
Correspondents:
New York
Correspondent:
Charles Babcock
Paramus Plaza I
140 Route 17 N.
Paramus, N.J. 07652
201/967-1350
Washington, D.C.
Senior Correspondent:
Bryan Wilkins
Correspondent: Mitch Betts
1273 National Press Building
529 14th St., N.W.,
Washington, D.C. 20045
202/347-6718
West Coast
Bureau Chief: Jeffry Beeler
Correspondents:
Kathleen Burton
Kathleen Sullivan
1080 Marsh Rd.
Menlo Park, Calif. 94025
415/328-8084
Chief Copy Editor
Kathie Gow
Assistant Chief Copy Editor
Charlotte Zerna
Copy Editors:
Christine Cassetti
Deborah Fickling
Patricia Hall
Penny Janzen
Joseph Salvey
Barbara Sutton
Kimberly Valloch
Lory Zottola

Assistant to the Editor
June Fettig
Editorial Assistants:
Lorraine Brien
Cheryl Tynan
Contributors
Education
J. Daniel Couger
Human Computation
Jack Stone
Transparent Time
Larry Long
Microcomputers
Thomas Madron
The Data Center
John P. Murray
Leads on Science
Charles P. Lecht
Special Publications
Computerworld Select
George Hamer, Editor
Computerworld on Communications
Bruce Hoard, Editor
Computerworld OA
Ann Dooley, Editor

Main Editorial Office: Box 880, 375 Cochituate Road, Framingham, MA 01701 617/879-0700

Computerworld is a member of the CW Communications/inc. group, the world's largest publisher of computer-related information. The group publishes 93 computer publications in 24 major countries. Nine million people read one or more of the group's publications each month. Members of the group include: Argentina's Computerworld/Argentina, Asia's The Asian Computerworld, Australia's Computerworld Australia, Australian Micro Computerworld, Australian PC World and Directions, Brazil's Dataworld and MicroMundo, China's China Computerworld, Denmark's Computerworld Danmark and Macintosh, Finland's Mikro, France's Le Monde Informatique, Golem (Apple) and CPC (IBM), Germany's Computerwoche, Microcomputerwelt, PC Welt, Software Markt, CW Edition/Summer, Computer Business and Commodore Magazine, Italy's Computerworld Italia, Japan's Computerworld Japan and Power Computing, Mexico's Computerworld Mexico and ComputaMundo, Netherland's Computerworld Benelux and Mikro Info, Norway's Computerworld Norge and MB-eData, Saudi Arabia's Saudi Computerworld, Spain's Computerworld Espana and Micro Sistemas, Sweden's ComputerSweden, Mikro Datorn, Min Hemdator and Svenska PC World, the UK's Computer Management, Computer News and Computer Business Europe, the U.S.' Computerworld, Hot CoCo, mCode, Infoworld, Macworld, Micro Marketplace, Microcomputing, PC World, Run, 73 Magazine and 68 Micro

VIEWPOINT

Managing the data center crisis

THE DATA CENTER
John P. Murray

A a unfortunate situation that arises in data centers is associated with the introduction of new application systems or substantial changes to existing systems that degenerate into chaos.

The scenario is often the same. The new system is intended to provide substantial benefits to the organization, improve customer service and reduce costs.

For awhile, until the stress testing — if stress testing is used — or worse yet, the production stage is reached, all will appear to be going well.

But suddenly, the new system turns into a monster that threatens to destroy the data center operation and, in some cases, the entire organization.

Out of control

What now appears is a system that has consumed all available hardware resources. The system is out of control, has disrupted the entire work flow of the data center, destroyed the data center's client service levels and is creating an increasingly difficult situation.

Such situations do arise. They bring with them turmoil, finger pointing, unrest, anger and, eventually, senior management involvement on a rather intense level. Such situations can and should be avoided. Avoidance requires strong data center management, sound control and discipline.

Once into such a situation, it is common to attempt to fix, or avoid, blame for the current state of affairs. Often an attempt will be made to analyze the causes of the difficulty, to philosophize about "how we came to this."

These are exactly the wrong approaches at that time. Consideration of these aspects is appropriate, even necessary, but at some later date, not at the crisis time.

The key issue, once into a crisis, is to gain control, to stop the bleeding. Time and effort expended on anything other than containing and correcting the immediate crisis is simply wasted.

The key issue, once into a crisis, is to gain control, to stop the bleeding. Time and effort expended on anything other than containing and correcting the immediate crisis is simply wasted.

The tendency to panic, to resort quickly to whatever appears to offer some assistance, must also be avoided. The first step must be to make a calm, factual appraisal of the situation.

Ask yourself the following

Ask yourself the following questions. What specific programs are causing the problem? Are poor programs the only problem? Is the client and operations documentation also at fault? Are the system controls that are in place correct and adequate?

A common cause of difficulty in such a circumstance are untested or inadequately tested programs. These should be identified and an immediate effort mounted to correct those programs that are causing the difficulty.

The data center management must take a strong position in this effort. Changes to these programs must be carefully tested. They must work correctly and more effectively than those they are to replace, or they should be rejected.

It is often the case that the "nice person" syndrome is in effect in the data center. This often compounds the problem. Adopting a pattern of accepting untested, or not carefully tested, programs in an attempt to avoid hurting someone's feelings or creating conflict is not going to help anyone.

The goal of data center management in the case of an application system crisis must be, number one, to keep things from becoming worse, and number two, to build appropriate controls to move steadily toward making things better.

Swift and decisive action

Someone, obviously not the original project leader, should be selected to manage the way out of the crisis. That person should have absolute authority and control in order to be able to act swiftly and decisively. Clearly, this must be someone who is strong and not afraid to take the required action. Such action will likely bruise some egos.

This is particularly true if consultants have played a role in bringing the organization to such a state. Be that as it may, there is no time, given the circumstances, to consider anything other than the achievement of the required results.

These situations often have an insidious aspect. They seem to arise almost from nowhere, and in a very short time they reach disaster status. Data center management must work to develop appropriate controls that will effectively sound early warnings, which can be used to alert everyone to the potential for disaster. When those controls are in place, they must be relied upon and used by data center management.

Sound the alarm

Sounding the alarm does place the person raising the issue in an uncomfortable position, particularly in a situation where a great deal is riding on the new project and where considerable time and expense have been devoted to the project.

If outside assistance, such as consultants, is involved, the situation becomes more difficult, because these people will have a need to protect their positions.

However, the data center manager is remiss if, when it becomes clear that difficulty looms, nothing is done to correct the situation.

Crisis can be avoided. What is required is the ability to see it coming and the willingness to do whatever is required to correct the situation. Discipline, firmness and control are the watchwords in these situations.

Murray is director of management information services for Rayovac Corp., Madison, Wis., and author of Management Information Systems as a Corporate Resource, *published by Dow Jones-Irwin.*

Software fads: Costly waste or valuable resource?

HUMAN CONNECTION
Jack Stone

There is an unfortunate side effect from the heavy sales promotion of the new multifunctional superintegrated programs for personal computers in the corporate arena — also known as Lotus Development Corp.'s Symphony and Framework — that is becoming chronic.

Such marketing efforts inadvertently, but inevitably lead to the creation of yet another fad, and the subsequent forcing of one more instance of what I term the "maelstrom effect" on the part of the personal-computer-obsessed users, especially managers and executives. This situation evolves when users, however guileless, are swept up into a whirlpool of enthusiasm for the latest and greatest personal computer technology, virtually irrespective of knowledge or need, fervently believing that without it, they will not reach the quintessential zenith of their productivity potential. This results in a soaring demand for expensive software — one copy per system if the license specifications are adhered to — and more personal computer power including hardware add-ons, training and ongoing systems support. The end results? In a number of cases, dollars are wasted and, even more important, the efforts of scarce technical talent are dribbled away in providing ongoing support.

Now then, along with everybody else in the business, I am a devout believer in the expanding of computing capability when the need exists. But when the costs in terms of systems outlay and follow-on support become extravagantly large relative to computing gains, then the procurement brakes should be applied and the maelstrom attenuated until saner heads can prevail.

The good old days

Let's take a look at a few numbers to make the point. We will first harken back to those good old personal computer days of yesteryear, days of 64K bytes of random-access memory (RAM) and twin 160K-byte floppy disk drives — which, lest we forget, continue to do a journeyman's job for a very large population of users. The move into the realm of Lotus' 1-2-3, for example, typically requires an upgrade to 256K-byte RAM (or equivalent RAM/read-only memory combinations) plus twin 320K-byte drives. Add up the cost of software and hardware increments, and one is staring at a bill of around $1,000 per system. If we toss in the extras of training and ongoing systems support, something on the order of a $2,000 investment per single-user machine — double the hardware/software costs — is not overstating the situation. Now, if we take as a model an organization with a hundred machines installed — all candidates for upgrading — the final tally approaches a ballpark estimate of $200,000.

Now let's start with that number as a base, and take a look at the Symphony upgrade. One can perhaps sneak by with a 512K-byte RAM and the same disk drives, but I don't think that configuration is realistic, and even if it were implemented, I think that users would shortly come back to the negotiating table, demanding 640K-byte RAM and a hard disk. This latter upgrade plus software comes in at about $2,000 per machine, and, if we add in the same amount as above for training and support, we arrive at a rough estimate of a $4,000 investment per single-user machine. For the hundred-machine organization, the price tag for the upgrade from Lotus's 1-2-3 to Symphony is a whopping $400,000.

I am not suggesting that the superintegrated programs are not of great utility for business users. What I am saying is that decision makers have to discriminate legitimate need from opportunistic fadism before committing a company — and its hard-earned cash reserves — to an applications programming system of this complexity and expense. ‡

Stone is an independent management consultant, educator and writer, specializing in DP human communications and personnel development, based in Washington, D.C.

Stuff it to JES

CICS, DSPrint, IMS, and SAS* Reports

The Dynamic Report System provides a bridge between on-line systems and the JES report queues. Move it all to JES and gain performance along with centralized report distribution. Let JES account for, archive and distribute reports to 327X printers, local printers, PCs, plotters, microfilm devices and 5210s.

And Let JES Distribute Your 328X Reports

VPS, the VTAM/TCAM Printer Support subsystem places 328X/328X printers, PCs, plotters, 5210s, and word processors directly under JES. These non-dedicated devices become JES IMI print stations. VPS expands JES's local and remote hardcopy alternatives as it reduces real network costs and complexity. Ask our 400 users and their 20,000 printers.

Levi, Ray & Shoup, Inc.
P.O. Box [illegible] · Dallas, TX 75[illegible]
DALLAS (214) 3[illegible] · TELEX [illegible]
*A registered trademark of the SAS Institute

For a tighter grip on manufacturing productivity... grab hold of RMS/38

Not many IBM/38 software packages offer tight-fisted MRP control. Perhaps you already found that out by using another system. If this is your first time, check out the features that are important to you. Our users enjoy the benefits of a closed-loop MRP II system that allows direct access for anyone to all the information stored. We have a query facility that lets you generate user reports. And we utilize an advanced data base architecture which increases programmer productivity, making changes needed for expansion simple and economical. We even have a PC link which lets you transfer information to your IBM Personal Computer for interaction with popular planning micro products such as 1-2-3™ from Lotus.®

Loaded with RMS/38 the potent IBM System/38 can make your business hum with the precision these economic times demand. With anything else, you may have to settle for second best. In the fiercely competitive arena for manufacturing management efficiency, where survival depends on increased productivity — and profits — the software system you use can spell the difference between satisfaction or frustration, maybe even success or failure.

Only RMS/38 has 15 powerful applications to provide you with all the strength you'll ever need for total control. Control not only of manufacturing but all those vital support functions as well, including distribution and finance. Total software...RMS/38!

Reduce inventory; eliminate parts shortages; acquire time for skillful buying; schedule production based on demand, not parts availability; determine whether to buy or build needed components; improve part number, inventory, and routing accuracy; and order in time for delivery on time. You can with RMS/38. If your present MRP system, whether manual or automated, represents something less than a total integration of business and manufacturing systems, if it doesn't offer the distribution and financial support of closed-loop MRP II; if it doesn't offer you control in an unpredictable environment; then maybe it's time you investigated the building block software of RMS/38.

For a free demonstration or more information, contact PCR, Professional Computer Resources, 2021 Midwest Road, Oak Brook, IL 60521 (near Chicago). Also in New York, San Francisco, and Los Angeles.

pcr
ALL THE SOFTWARE YOU'LL EVER NEED
312/932-2200

1-2-3® is a trademark of the Lotus Development Corporation

VIEWPOINT

Micro standards in, innovation out

READER'S PLATFORM
Ira H. Krakow

The era of standard microcomputer hardware and software has arrived. Hardware and software selection has been reduced to the ritual of brand name recognition. Vendors have concentrated on high-budget advertising and slick packaging, instead of on product quality and user needs. The result is that today an innovative product without a multimillion dollar marketing budget is doomed to failure. A mediocre product with a multimillion dollar budget may succeed if the competition is not IBM or AT&T, both of which sport multibillion dollar budgets.

Suppose you've been given a four-month project of recommending microcomputer hardware and software for your company. Your boss has told you to determine user requirements, research the market for the latest products and perform a cost-benefit study to determine which configuration is best. Do you need to do all this? No. Do the following:

- Spend an hour browsing through any of 100 computer magazines. Be sure the paper is sufficiently glossy and the cover story is something like "Morticians Use Micros to Cut Embalming Costs." Try to read an article. Note that the first page (which consists of one column of the article and three columns of advertising copy), is followed by 15 pages of advertisements.
- Strike up a conversation at the water cooler with secretaries. Ask them what the label on the word processor says.
- Your research done, pick from this list of products:

Microcomputer. Anything with the IBM Personal Computer logo on it.

Disk drives. Get a 10M-byte hard disk. If your budget allows, any multiple of 10M bytes will fill the bill.

Memory. Pick a number — divisible by 64 — between 256 and 640.

Integrated spreadsheet. Buy Lotus Development Corp.'s 1-2-3.

Database management software. Ashton-Tate's Dbase III should do.

Word processing package. If a secretary said Wang in response to your question, choose Multimate. Otherwise, choose Wordstar.

- Take a well-deserved four-month vacation in the Bahamas.

This scenario, while tongue-in-cheek, is uncomfortably close to the truth. The much-publicized shakeout in the microcomputer industry has affected all of its components. There is a glut not only of IBM [Personal Computer-compatible] computers, but also of spreadsheets, data base management systems, word processing packages, diskette drives, hard disks, add-on boards, computer books and magazines.

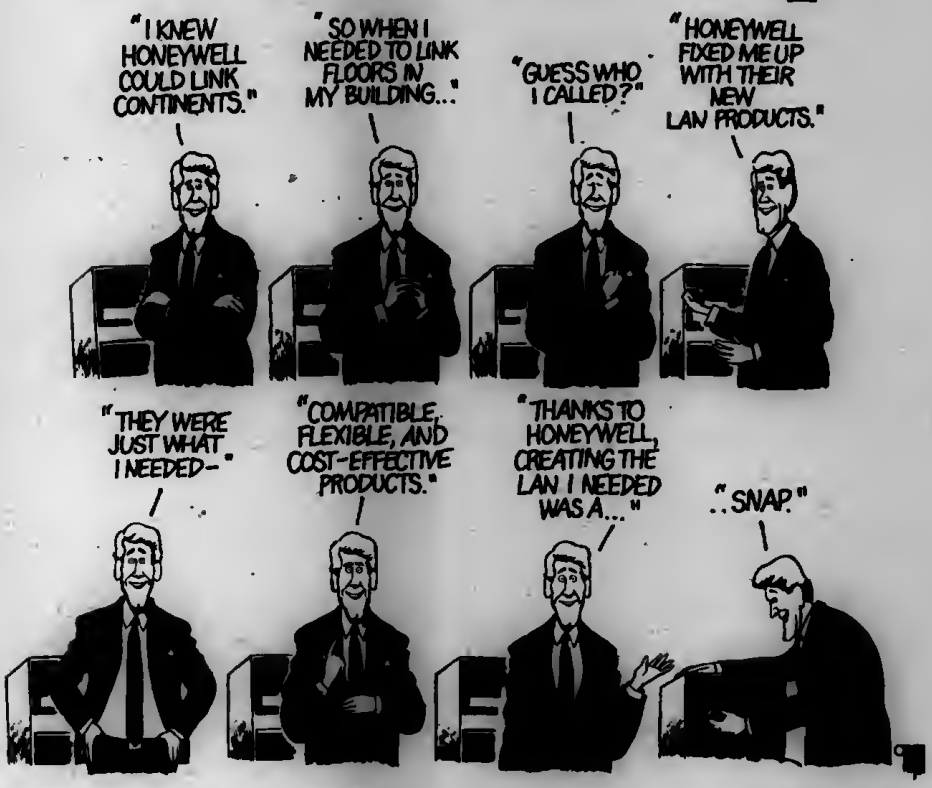
The result of this glut and uncertainty has been a retreat to brand name loyalty and a low tolerance for new ideas. This is understandable. A product that has been around for a while and has a substantial user base is probably relatively bug-free. The vendor (particularly if it's IBM) stands a better chance of sticking around.

Even well-established vendors with big advertising budgets, such as Lotus and Ashton-Tate, have had problems convincing the marketplace to accept the idea of all-in-one integrated software, as embodied in Symphony and Framework.

What chance does an innovative microcomputer product have nowadays? Regrettably, a very small one. Microcomputer standardization has become a barrier to creativity. ‡

Krakow is a Stoneham, Mass.-based independent microcomputer software consultant and the author of Lotus 1-2-3 Self-Taught for the IBM PC *and* Managing Projects Using the IBM PC.

"How Honeywell makes linking 3 floors or 3 continents a snap."



Introducing Honeywell's Local Area Networking Products.

Honeywell has long been a leader in providing advanced networking and communications capabilities.

In the 70's, we offered better ways to link resources on different continents. Today, we're offering better ways to link resources on different floors, even between different buildings. Honeywell's Ethernet Product Line gives you this capability. It's just what you'd expect from a leader.

Honeywell's Ethernet Product Line is modular, cost effective, and complies with important industry standards. It also provides the flexibility you must have when you need to increase the number of users in your network, or when you need to link single terminals with more than one host. And these state-of-the-art, local area networking products make it easier to disperse the benefits of distributed processing throughout your organization.

Now you can link synchronous and asynchronous terminals, professional work-stations, and minis with multiple hosts. All on one network. And you can link into Value Added and Public Data Networks.

The whole product line is compatible with Honeywell's Distributed Systems Architecture and our entire selection of network products.

Its modular design lets it grow as your requirements grow. It offers an almost unlimited array of configuration options. It even helps reduce wiring and telephone line costs.

So, for the solutions to your local area networking needs, or for any networking or communications application – look to Honeywell. For more information, call toll free at 1-800-328-5111, extension 2725. In Minnesota, call collect 1-612-870-2142, extension 2725.

Together, we can find the answers.

Honeywell

Support Systems For the Executive

A Look at Five Installations

By Eliot Levinson

Executive support systems are currently the high fashion for senior managers. This article describes the realities of development and impact of executive support systems in five large firms. The focus is on five key elements that must be managed for these systems to be effective:

1) A business problem or vision that defines the purpose of the system.

2) Sponsorship by a senior executive.

3) The organization of MIS computing groups as effective support organizations that translate managerial needs into technical systems.

4) A well-defined, accessible data base.

5) Resistance as the new systems change established procedures and reporting relationships.

Companies initiate executive support systems for three reasons: to solve a business problem, to make executives more efficient or to signal to the organization that technology should be employed. A distinct difference in development and use exists between use of an executive support system in firms where it is initiated as a problem-solving tool and firms where it is brought in for other reasons.

The problem-solving systems begin small in number of applications and number of users and then grow. They gradually evolve into planning systems. The efficiency systems begin with a larger number of users and atrophy. At the end of two years, only the problem-initiated systems survived. Distinction between the two types of systems is the relationship of the executive support system to the core of the business.

The business problem is most important during the early stage of system development. Two of the systems in this discussion were established as crisis responses by new chief executives, who were looking to the new technology for an effective solution to serious problems.

Smokestack was losing $250 million a year, and the chairman asked for a system that would allow him to control costs.

At Wellness, sales had decreased substantially, and the CEO wanted a data base that would allow him to shift the company to an analytic marketing orientation.

At International, the division head knew that unless the company could come up with a clear strategic plan and find better ways of communicating financial information, it was headed for hard times. He looked to executive support systems as a possible way of averting serious problems.

Clear expectations of the system's capabilities and benefits to the firm by the executive sponsor play an important role in its early development and ultimate utility. At Wellness and International, the sponsors defined their problem or organizational vision clearly and manageably so these issues were addressed. In both cases, a "critical success factors" process was used with a small group of top managers to clarify goals and specify the type of information executives needed. This process also served to establish a sense of mission within the organization.

At Smokestack, the function of the support system was initially more ambiguous. The early prototype focused on cost problems, but there was no clear direction because several other problems were apparent at the same time. It was not until two years and three pilots later, when executive support focused around the budgeting process, that the system began to function.

At Manuco and Toy, the executive support system was not linked to business problems. Although Manuco had several long-standing business issues caused by its competitive situation, these were not employed as a catalyst for the executive support system. The only expectation set by the chairman of Manuco was that senior executives should experiment with information technology and provide an example for people below them in their organization to use it. At Toy, the president wanted a machine for the 30 vice-presidents and their secretaries that would help them communicate and manage their time better. In comparison with the effectiveness systems, the initial expectations of these systems were low, as they supported tasks peripheral to the core needs of the business.

Installation phase

As implementation evolves through and beyond the installation period, the original business problem is not as important as in the organizational phase. During the installation phase at Wellness, the support system evolved to include more applications and become useful at lower levels in the organization. The focus of the system moved from present problems to planning of future products, and a component for the sales organization was added. At International, several financial, competitive and nonfinancial data bases were added to the initial support system, and the executives of the divisions were put on the system.

Initially, executives use the support system to retrieve the management reports they used to receive in hard copy. As the support systems evolve and their staffs develop competence in using decision support tools, the systems are increasingly used for "what-if" queries and scenario building.

At Smokestack, the evolutionary design was subject to trial and error. Since the initial goals of the executive support systems were ambiguous, a series of support systems were developed for various executives, including an executive personnel system, a pricing model, a management reporting system and a plastics division model. None of these systems was totally successful, and they reflected the chairman's lack of precision in his initial call for executive support. They did, however, serve to expose senior executives to some of the possibilities of information technology.

The approach to executive support systems at Manuco and Toy during the installation phase could be termed the "portfolio approach." The information systems departments provided a range of applications such as electronic mail, calendars, word processing, spreadsheets, automatic dialing and corporate reports. The rationale was that with a wide choice of applications, the executives would find something useful. At both firms, a significant number of executives utilized electronic mail, though a lack of participation on the mail system at Toy limited its use. Over time, use of the communications tools diminished, and only a small number of people used them.

The difficulty of implementing the efficiency systems can be attributed to the fact that senior executives have satisfactory support in the form of executive secretaries and assistants, and subordinates respond to their demands quickly. On the other hand, business-problem-based systems provide value-added information about a core concern of the business.

Institutionalization phase

During the institutionalization phase, the *raison d'etre* for executive support systems shifts from a business crisis to a combination of monitoring business health and looking toward the future.

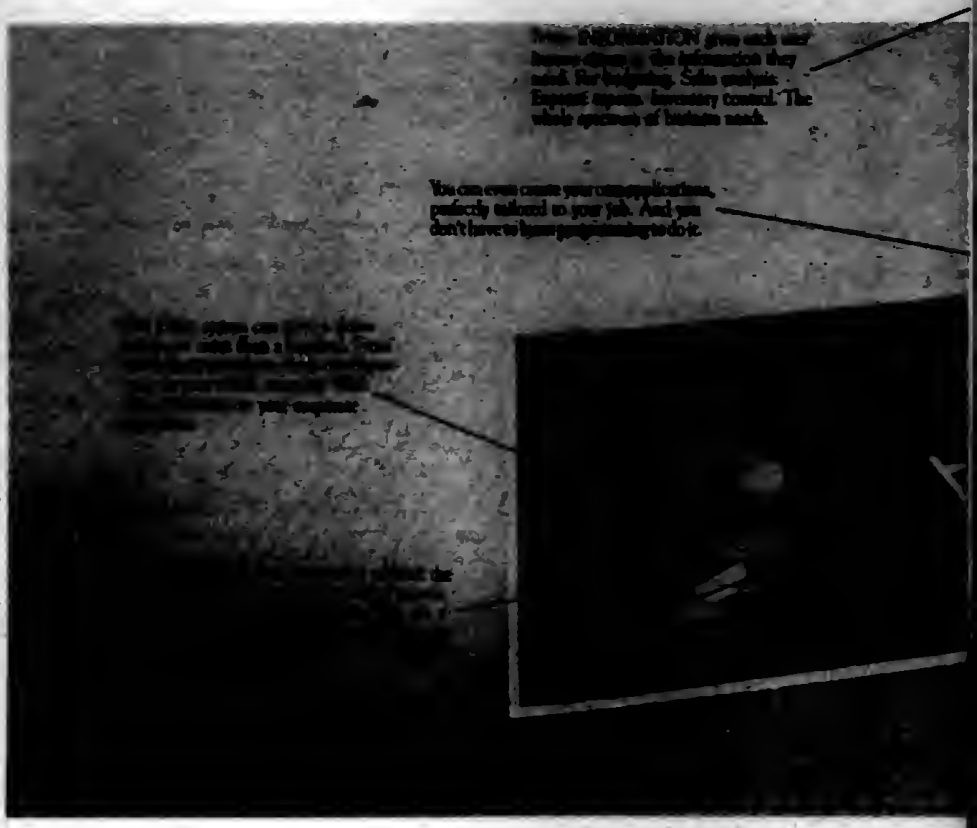
At International, the president has used the executive support systems in assessing new ventures as a way of avoiding the decline of old products. At Wellness, the executive support system is being used to make decisions about new product development.

Another aspect of executive support in the institutionalization period is its linkage to core organizational processes. At Smokestack, it is utilized in the budgeting process, at International in strategic planning and at Wellness in marketing and sales. It is interesting to note that those executive support systems that were not institutionalized were not linked to any core business function.

Sponsorship is the initiative role the senior executive plays in the design, development and use of support systems. The executive's participation makes more of a mark on the implementation of executive support systems than on any other element in the initiation and execution of executive support. The sponsor's functions include:

Finally, personal software for big computers. Prime INFORMATION.

No, it's not a PC. It's one of many terminals connected to a single, powerful Prime® system. What makes it personal? The revolutionary Prime INFORMATION™ software.



- Initiating the demand for executive support systems.
- Establishing an organization to implement them.
- Defining the purpose.
- Developing usage.
- Utilizing outputs.
- Moving the systems through the organization.

In the firms we researched and worked with, there have been a variety of patterns of sponsorship that include executives who view executive support systems as an essential management tool and those who see them as peripheral.

There are executives who participate in the design, development and evolution of the system, while others delegate it to the information systems department. There are those who define the purpose of the system very early, while others discover its utility during implementation.

After saying, "I want one," the next step was defining what "it" was. At this stage, there was a variety of responses by the sponsors.

The sponsorship role changes during the life of the support system. Initially, the titular sponsor, that executive who called for the system, is most important. As time moves on, an operating sponsor, the person delegated to manage the installation and diffusion of the system, becomes most important.

Organizational phase

The titular sponsor's motivation to call for executive support systems is spawned by two situations: the combination of a crisis he wants to solve and being new to the job; or a desire to have executives utilize computer technology as part of their daily work.

The titular sponsors in this study were divided into two categories. Those who called for effectiveness systems were all new to their jobs. They were looking for information to aid them in the solution of some problem, to provide a quick understanding of how the organization functioned and to bring about organizational change. The sponsors who called for efficiency systems had been in their jobs longer and were motivated by a generalized desire to have other senior executives demonstrate modernity and work more efficiently by using technology.

After saying, "I want one," the next step was defining what "it" was. At this stage, there was a variety of responses by the sponsors. At Wellness, there was a problem-solution support system match. The CEO and his top managers went through a critical success factors process and defined the information needed to analyze their markets, assess performance of their products and link the two to their sales territories. This exercise articulated a clear vision of where the management team was heading in aiming at high-profit margin items.

At Smokestack, the chairman and the head of decision support utilized a similar problem-solution match to develop a prototype system for cost control, but no other executives were involved. At International, the "discover as you implement" approach was used in defining the system. The comptroller, who had been developing accounts receivable and forecasting applications, and the new CEO, who was trying to find a way to communicate financial information easily, requested that a computer graphics system be linked with the data base.

At Manuco and Toy, the CEOs defined the support systems through delegation. At Manuco, the chairman stated that he wanted a computer on every group executive's desk, symbolizing to the rest of the organization that senior management was using technology. He then delegated sponsorship of the project to the information systems organization.

At Toy, the president asked an engineering group and then the MIS group to find a communications tool for senior executives that would combine a telephone and computer tools to help them with their management. In both cases, the titular sponsor saw the support system as technical support and delegated its definition to technical organizations. This approach was in sharp contrast to the other three firms where the titular sponsors saw the systems as management tools and involved themselves and other executives in defining the systems.

Operating sponsorship

The role of sponsorship shifts from the titular sponsor to the operating sponsor as the task changes from envisioning the support system to installing it and evolving its usage within the organization.

The role of operating sponsorship is best demonstrated by its absence. At Smokestack, the chairman delegated installation of the project to the chief financial officer, who resigned, and then to another vice-president, who was not interested in the system. During this 15-month hiatus, the computing group initiated a series of less than successful support systems for division heads and various vice-presidents. A new chief financial officer was appointed who implemented a management reporting system for the group vice-presidents that had been stalled by his predecessor, and then the computing group, under the auspices of the chief financial officer, developed a model to be used by all groups in the budget process.

Sophisticated knowledge of computer technology was not necessary for effective use of the support system by senior executives. The systems incorporated menus, touch screens and fourth-generation languages.

This model allowed the chairman and chief financial officer to look at the relationships of the various groups as a value-added chain, something they had previously been unable to do. The budgeting model is becoming the executive support system as it allows senior management to look at individual businesses and their relationship to each other, which is the current central problem of the firm.

The comptroller at International represents a good example of operating sponsorship. He acted as the gatekeeper between the computing group and the president, made decisions regarding applications development, linked the support system to the strategic planning process and executed all of the applications so they were usable by other executives. As his primary contribution, the comptroller directed the financial analysts in learning to develop and utilize the executive support systems. He was also instrumental in diffusing executive support systems usage downward into the various divisions of the group.

Sophisticated knowledge of computer technology was not a necessary condition for effective use of the support system by senior executives. The executive support systems were very easy to use, with such features as menus, touch screens and fourth-generation languages.

During the installation phase, the executives learned to utilize the technology, usually beginning with retrieval of the standard reports they had received in hard copy. When more demanding tasks, such as querying and modeling, were needed, the executive had the system chauffeur-driven by one of his staff. The CEOs at Wellness and International both stated that executive support systems gave them an understanding of the dynamics of their businesses they had never had prior to the systems' installation.

Directors to users

During the institutionalization phase of executive support systems, the sponsors became more users of the system's output and less directors of its development. By demanding a coherent set of information within an easily accessible, defined framework, these sponsors had driven the organizations under them to hire and train managers with computer skills who spent a significant part of their time inputting data for the system. At both Wellness and International, line managers and staff analysts adapted their work to the support system.

During the institutionalization period, there are two processes that occur: the executive support system is diffused to other parts of the organization where new sponsors must adapt them to their needs; middle management has to fit analyses and reports into the framework of the support system in answering requests of superiors.

The importance of new sponsorship can be seen at International. The MIS group disseminated the tools developed in the original division to another group. The group executive did not perceive the financial management tools as linked to his job, so what had been an executive support system became a middle-management efficiency tool, helping the financial analysts in the new group to get their work done faster.

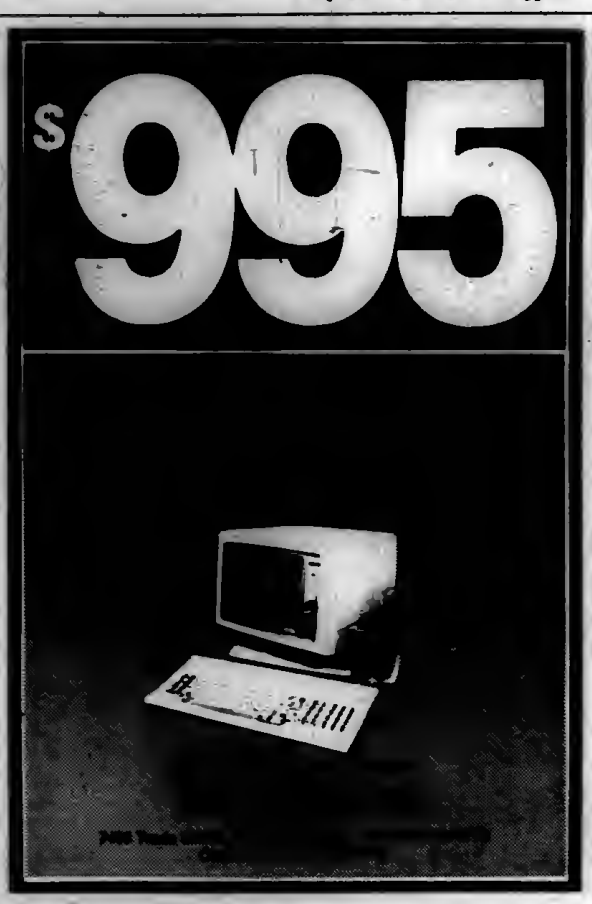
At Wellness, and in the original group at International, the division heads and middle managers were highly affected by the executive support systems. The systems imposed a discipline on the types of questions senior executives asked of their subordinates, which in turn demanded that middle managers utilize computer-based skills and begin thinking in the framework of the executive support systems.

In the three firms where problem-oriented executive support systems were established, the middle managers perceived their advancement as linked to their ability to utilize decision support tools.

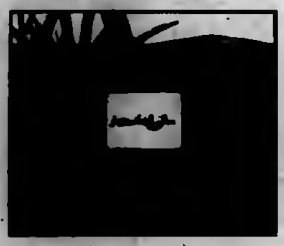
End-user tools

Executive support systems are end-user computing tools. The sponsor plays the key role in defining the use of the system so that it is used as a management tool.

There were two patterns of sponsorship that delineated whether the executive support system was ultimately useful as a management tool. One group of sponsors, exemplified by either the titular or operating sponsor in the effectiveness groups, saw the executive support system as an extension of themselves and participated actively in its design and



Saudi Computerworld is your link to the Saudi Arabian computer market.



The Saudi Arabian computer equipment market was worth $78 million in 1981. Researchers forecast a total market value of $222 million by 1987. The market is well-developed with computers, minis and mainframes, in virtually every sector. Government and related public organizations represent 50% of the market.

Now you can reach this valuable market with *Saudi Computerworld*. As part of *Computerworld*'s worldwide family of computer publications, *Saudi Computerworld* shares in the largest international computer information network. It is a monthly bilingual (Arabic/English) magazine circulated to 12,000 DP professionals in the computer user environment in the Gulf Peninsula. *Saudi Computerworld* reports on news and ideas of interest to small and large computer users in business, industry, government, and educational organizations.

CW International Marketing Services gives you one-stop advertising service in countries around the computer world. For more information on *Saudi Computerworld* or any of our other foreign publications, just fill out the coupon below.

Diane La Rangile, Manager
International Marketing Services
CW COMMUNICATIONS/INC.
375 Cochituate Road, Box 880
Framingham, MA 01701 (617) 879-0700

CW COMMUNICATIONS/INC.
Publishers of *Computerworld* and other leading computer publications around the world.

Please send me more information on:
☐ *Saudi Computerworld* ☐ Your other foreign publications

Name _____ Title _____
Company _____
Address _____
City _____ State _____ Zip _____

the establishment of an organization to implement and manage it. Systems implemented under these sponsors reached full implementation. The other group delegated the design of the system to others, giving the message that it saw executive support systems as technical support rather than as a management tool.

There are two constructs that should be considered in understanding sponsorship. The first is that business crises or visions create effective sponsorship; the second is that some executives, the *co-opters*, view the technology as a valuable phenomenon that must be turned to their advantage, while others, the *victims*, do not understand it and therefore manage it by delegating it to technical groups and do not involve themselves in the process of implementation.

Computing groups

The role of computing groups is central to executive support systems throughout the life cycle of implementation. The structure of the group, its relationship to management and the approaches it uses in developing the support system at different stages of evolution significantly impact the effectiveness of the support system.

Executive support systems present MIS with the extremes of the problems and opportunities associated with end-user computing. The perceived power differential between general managers and MIS staff, combined with the differences in the nature of managerial and technical work, affect the process of defining and implementing easy-to-use but complex support systems.

In the various approaches that MIS or management take, there are three key factors to be controlled that affect implementation: problem definition, the type of executive support system presented as the solution to the problem and the organizational sponsorship. When all three factors are addressed, as in the case of management-generated support systems to solve a defined problem, the implementation process will move most effectively to meet expectations. When these expectations are not well defined, the executive support system is less likely to be effective.

There are three types of information systems organizations associated with executive support systems: the data processing group, the segmented group and the integrated group. The data processing group includes the data center, office automation, decision support systems and development. The segmented group is made up of DP, systems development and end-user computing. The integrated managerial group would typically consist of end-user management and end-user computing.

The DP group differs little from the groups that constructed transaction processing systems a decade ago, but they have since absorbed new technologies, including office automation and decision support. The DP groups approached executive support systems as a traditional systems development effort. These groups were staffed by people with strong technical backgrounds who had a product orientation. They took full delegated control of the projects rather than sharing decision making with management and placed major emphasis on the development of hardware. The DP groups concentrated their effort more on the early phases of the project rather than on installation.

In the segmented MIS organization, the end-user computing function is autonomous: Data processing is handled by one group, systems development by a second and user-controlled technologies by a third.

End-user computing groups differ from traditional DP groups in several respects:

- They are service rather than product-oriented. Their role is to help the end user accomplish his aims and establish the most appropriate hardware and software environments in which to do this. They do not "control" the system. From the outset, it is clear that decisions concerning use of the system come from the end user. In two of our cases, it was decided prior to beginning work to build a turnkey system for the end user.
- End-user computing groups are staffed by people with a business background, or project teams are set up to include end-user management.

"HOW LONG DO YOU PLAN ON STAYING WITH OUR COMPANY?"

INTRODUCING THE BURROUGHS B25. THE MICRO COMPUTER THAT GROWS WITH YOUR BUSINESS.

Buying a computer is a lot like hiring an employee. You need one that can produce a lot now and even more in the future.

Take the B25. It's modular, so when you need more memory or storage, you simply snap on more modules.

Another feature that allows the B25 to grow with you is its ability to network. You just add workstations and people will be able to share the same data and memory at the same time.

You can also share peripherals—like printers. Which means several workstations can be linked to one printer so many people can use it.

What's more, the B25 has three operating systems (CP/M-86,® MS-DOS,™ BTOS) so you can run the most popular software available today.

And, of course, the B25 is backed by Burroughs' worldwide service and support.

The Burroughs B25. You wouldn't hire a person who couldn't grow with your business. Why buy a computer that can't?

© 1984 BURROUGHS CORPORATION

MS-DOS is a trademark of Microsoft Corporation. CP/M is a registered trademark of Digital Research, Inc.

For more information about the B25, mail coupon or call toll free: 1-800-621-2020.
CW-1128

Name/Title _____
Company _____
Address _____
City _____
State _____ Zip _____
Telephone _____

Send To: Burroughs Corporation, Dept. B25, P.O. Box 10934, Chicago, IL 60680

Burroughs

THE QUESTION ISN'T WHO'S BIGGER. IT'S WHO'S BETTER.

At the manufacturing firm, executive support was given to an engineering group within the management systems organization, which then developed technical specifications for personal computers to be used by executives.

■ End-user groups use an evolutionary design process that starts with a prototype and adds applications incrementally, as opposed to the traditional DP process of developing the system fully before usage.

The integrated MIS groups report directly to management as members of the executive's staff and have only a "dotted-line" relationship to the MIS organization. None of the groups we studied started as integrated groups, but they evolved that way as implementation of the executive support systems progressed.

The staff within the integrated group is more managerial than technical in background and demonstrates consulting skills. However, they have a strong background in computer tools. They view information technology as the tool to accomplish a primary business task, such as financial planning or marketing.

The differences and similarities between the groups can be seen in their definition of and approaches to implementing executive support systems at different stages of development.

Determining need

The main task in the early stages of executive support systems is defining the problem to be worked with and choosing appropriate hardware and software. At Wellness, the end-user computing group interviewed several subsidiary presidents to find a situation where an executive support system would meet a need. The group found a subsidiary where the new CEO was looking for a tool to change the focus of the company from sales to marketing.

Critical success factor interviews were conducted among the four senior executives to determine what information was needed and then a prototype of the marketing support system was developed. At this point, Wellness committed the funding for the project and management, jointly with the end-user computing group, chose Express as the language for the executive support systems. A member of the end-user computing staff was assigned at Wellness.

In contrast to Wellness, at Manuco, executive support was given to an engineering group within the management systems organization, which then developed technical specifications for personal computers to be used by executives. The project was then given to a newly formed marketing group within the information systems group, which developed applications for an executive workstation. After the hardware had been ordered, the marketing group interviewed the 18 executives and their secretaries who were designated as users. Unfortunately, they found out in the interviews that the hardware did not meet the work requirements of the executives.

The main differences between the approaches of the DP groups and the end-user organizations were as follows:

■ DP groups emphasized hardware, whereas the end-user organizations concentrated on problem definition and software.

■ The DP groups were delegated or took control of the project, whereas the end-user groups shared decision making on the nature of the support system with line management.

Installation phase

In the installation stage, the task of the computing groups is to get the system functioning and work through start-up problems,

Data Processing Professionals:

WE BRING COMPUTER TECHNOLOGY AND PEOPLE TOGETHER

Northrop DSD, as a leader in the electronics industry with annual sales of $250 million, continues to grow to meet the needs of its customers. Outstanding opportunities are available to those business data processing professionals who aspire to share in our commitment to excellence and advanced state-of-the-art technology.

WE OFFER:

- Environment utilizing an IBM 308X running MVS and IDMS Data Base Management System; CICS command level; COBOL
- Outstanding growth potential
- Competitive starting salary and full range benefits package, including tuition reimbursement, savings plan (401K), relocation assistance, generous vacation plan, health and dental coverage

Our current expansion includes openings in:

- **TECHNICAL SUPPORT**
- **SYSTEMS & PROGRAMMING**
- **INFORMATION CENTER**
- **OPERATIONS**

For immediate consideration, forward resume with salary requirements in complete confidence to: Mr. David Kornhauser, Employment Representative, Dept. DP001, NORTHROP CORPORATION, Defense Systems Division, 600 Hicks Road, Rolling Meadows, IL 60008. An equal opportunity employer M/F/V/H. **ONLY PRINCIPALS NEED APPLY.**

NORTHROP

Defense Systems Division
Electronics Systems Group

The software picture

There are three categories of software used in executive support systems. The majority of executive support systems are custom-tailored, built from general-purpose decision support languages. The common software used for these systems are:

Management Decision Systems, Inc.'s Express; Information Builders, Inc.'s Focus; Mathematica Products Group, Inc.'s Ramis and Boeing Computer Services Co.'s EIS.

In the majority of firms with which we have worked, the company places considerable emphasis on choosing the language and then builds its own system.

Category II — Executive support systems. There are now specialized systems for executive support that are targeted at senior executives and are distinguished from the generic systems in their visual emphasis.

Category III — Communications and management support.

Digital Equipment Corp.'s All-In-One comes under this group. IBM's Professional Office System and Computer Corp. of America's Comet 204 are used more by middle and lower-level managers for general managerial support. However, these systems are used by senior executives for electronic mail and communications.

modifying the system so it is a real utility to the users.

International presents a typical example of where an end-user computing group worked on a parity basis with management, supplying half the manpower to teams developing different applications. After developing a prototype of a financial data base with a financial analyst, the computing staff went on to develop a nonfinancial data base, an accounts receivable package and a competitive data base. They also helped select a graphics package, but their choice for graphics was not the one finally picked by International's management. The computing group at International combined a strategy of evolutionary design with participative decision making by the management group.

In contrast to International, the computing groups at Manuco and Toy were delegated more responsibility, but they had less authority over the installation of the executive support systems. To cope with the ambiguity, the groups used a portfolio approach to the project. At Manuco, the MIS group decided that executives and their secretaries would use word processing, calendaring, electronic mail, document transfer, the Dow Jones & Co. News & Retrieval Service, corporate reports and spreadsheets. They put all these applications on very easy-to-use menus and provided individual training to all the executives and secretaries involved.

Their rationale was that out of the sumptuous buffet of software, the executives would choose something. Although secretaries did use the system, only four executives used it regularly and the computing group was unable to get access to the executives to train them — or to divisional data that might have been of assistance to the executives.

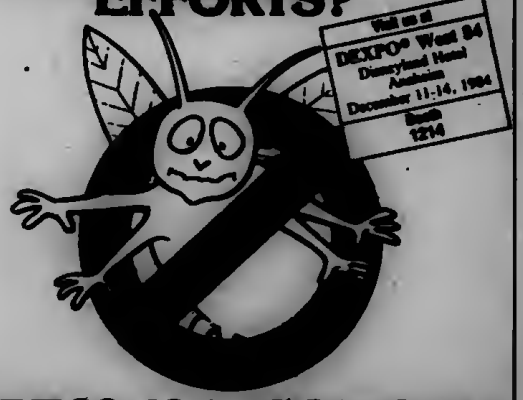
Another aspect of the DP group's approach was an emphasis on the computer interface. At Toy, the hardware, which was a combination of telephone and computer, took only an hour to learn to use, and at Manuco, considerable effort went toward establishing one-button access to any application faced with low usage. As a solution, the computing groups continued to expand the portfolio and the number of installations.

With both the end user and DP groups, emphasis was placed on user training during the installation phase. At International and Wellness, the computing group saw its function as developing expertise within the executive staff, and at Manuco and Toy the emphasis was placed on user-seductive software that could be of immediate utility to the executive.

At Smokestack, an effort was made to provide executives with easy-to-use management reports. The training efforts were more successful when aimed at staff people rather than at the executives themselves.

During the institutionalization phase of implementation, the tasks for the computing groups are to disseminate the system either downward, so it diffuses within the

ARE BUGS PLAGUING YOUR PROGRAMMING EFFORTS?



RXVP80™ IS A BUGBUSTER

RXVP80 finds bugs in your FORTRAN programs before you do!

It also documents your programs for you and tells you what parts of your programs aren't executed when they run. All this in terms of your source code. RXVP80 is as easy to use as your compiler and is available on most superminis and mainframes including DEC VAX and IBM equipment.

RXVP80 has an established track record for increased productivity, quality error-free software, on-time software deliverables, and decreased maintenance costs for large and small companies around the world.

WHO SHOULD YOU CALL?

The Software Workshop®
at
General Research Corporation

TOLL FREE 800-235-6788 · TWX or TELEX 910-334-1193 · DIRECT 805-964-7724

5383 Hollister Avenue, Santa Barbara, CA 93111

A Flow General Company

IN DEPTH/EXECUTIVE SUPPORT

organization, or across other divisions and to establish a standardized environment for operation of the system.

The efficiency-oriented communications systems ceased to exist after the installation phase. At Manuco and Toy, the support systems had been labeled as pilots, and both firms declared victory and ceased operation. At the other three firms, the support systems became embedded within the organization.

In all three firms, the computing groups moved toward being more integrated into the user organization. At Smokestack, the computing group moved from de facto reporting to MIS to reporting to the chief financial officer. At International, the comptroller's staff took over operation of the support system, and the computing group disseminated the applications to four other divisions. At Wellness, the computing organization lost its reporting independence from MIS but became fully integrated within subsidiary management.

At both Wellness and International, the support system affected the jobs of middle managers and analysts within the organization, and training programs were established to provide these managers with the necessary skills in use and growth of the technology. At Wellness, the increase in breadth and depth of the system necessitated a reconstruction of the data base, and that job was given to the computing group.

At Smokestack, the integration occurred around a central corporate-wide budgeting process. The computing group, as delegate for the chief financial officer, developed a budgeting model that affected all groups in the corporation. The computing group is currently in the process of training the various financial staffs in use of the tool.

In summary, the computing group is an important factor in executive support, since it affects the implementation at all stages and has considerable daily contact with the nuts and bolts of the system. The role of the computing group changes during the process of implementation from problem definer to implementer to maintainer and diffuser of systems. The computing groups that were most successful appear to have shared decision making more with management than those who were delegated more responsibility for the implementation.

The discussion of computing groups as a factor illustrates the problem of separating factors. It is obvious that the kinds of management sponsorship and problem definition greatly affect the role of the computing group. It is no coincidence that computing groups were more effective when business problems catalyzed initiation of the system and managerial sponsorship was active. However, the ability of computing groups to capitalize on these opportunities depends on their structure and skills.

The existence, usability and development of data bases were major factors in building executive support systems. Existing data bases were a necessary but not sufficient condition for the installation stage of the effectiveness-oriented systems and became important again in the institutionalization phase. The preexistence of a community of users is as necessary a condition for communications-oriented support systems as data bases are for business problem-based systems, because being accustomed to the technology speeds the implementation process.

The existence of data bases and a community of users demonstrates a seeding of technology within the firm that prepares it for the growth of support systems. During the last phase of implementation, data bases become important as diffusion of executive support systems from one division to others and to the corporate office demands the creation of a data warehouse and the establishment of common conventions surrounding data management.

Business problem-based executive support systems demand the presence of information on which alternative scenarios for decisions can be made against past performance, and categories of information may be compared with each other. In two of the firms we studied, Wellness and International, the use of information technology was well developed. Managers had apparently been exposed to information technology, and historical data bases on matters central to the firm were usable.

In contrast, information systems had been given very low priority at Smokestack prior to the arrival of the new management. At the beginning of the implementation process, the computing group found that all financial accounting had been decentralized to the subsidiaries, rendering financial data incomparable. The centralization of accounting practices and the development of a common general ledger system were necessary before financial data could be developed for an executive support system.

The development of these systems took 18 months and made the initial concept of a cost-control executive

*For product information and a full-color SuperSam poster, write to SuperSam, c/o LeeMAH Datacom Security Systems.

Data General
- SYSTEMS / ADD ONS
- LOCAL FIELD SERVICE
- NATIONAL DEPOT REPAIR
- UP TO 60% OFF LIST
- ALL CABLES

BUY • SELL • LEASE

PENBONE INTERNATIONAL
214-780-1000 217-351-7062

With Cullinet applications, there are no boundaries to what your company can accomplish.

It's an all too common problem. Manufacturing buys an application, and data processing is expected to integrate it with the corporate database. Finance buys an application, and data processing is expected to integrate it, too. And so it goes. Three years later, the job still isn't finished. And the ideal of a *true* database management system is still just that—an ideal.

If this problem sounds at all familiar, you'll be interested in a way to avoid it altogether—Cullinet.

Cullinet has systems in four application areas—financial, manufacturing, human resources management and banking. Each is a functionally superior product in its own right—which, of course, is a primary concern to the people who use them.

Even more important, each is built on the same foundation—our IDMS/R database. Through it, each is able to share data with every other Cullinet application. And that's something no one will appreciate as much as data processing.

By eliminating the boundaries between modules, we've eliminated the problems typically associated with applications software—duplicate data, multiple updates, file conversion and the like. The result: efficient processing throughout the company.

And if this integrated approach is the main advantage, consider also that our applications were built using ADS/OnLine, our powerful fourth generation language. This makes them easy to install and tailor.

For more information about our applications and our complete approach to information management, attend a Cullinet Seminar. You can make arrangements by sending in this coupon, or by calling, toll-free, 1-800-225-9930. In MA, phone 617-329-7700.

The Complete Software Solution

Cullinet: I'd like to learn more about your applications. Please arrange for me to attend a Cullinet Seminar.

Name _____

Title _____

Company/Department _____

Address _____

City/State/Zip _____

Telephone _____

CW138

Send to: Cullinet Software, Inc., 400 Blue Hill Drive, Westwood, MA 02090-2856

Cullinet

We understand business better than any software company in business.

© 1984 Cullinet Software, Inc. Westwood, MA 02090-2856

THE FUTURE OF 2400 BPS MODEMS IS LOOKING UP.

And so is yours.

Because compared to 1200 bps modems, our 2400 bps modems can effectively double your productivity. Without doubling your costs.

How?

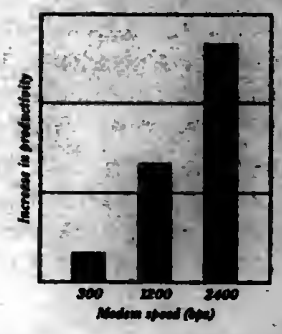
Simple. 2400 bps modems do everything twice as fast.

You can fill a screen in 8 seconds instead of 16. Transfer a full floppy in 24 minutes instead of 48. And cut your line costs in half by staying on the line half as long.

But more important, all this productivity is now worth the price. Because the prices of Racal-Vadic 2400 bps modems have just come down.

Now it doesn't cost twice as much to go twice as fast.

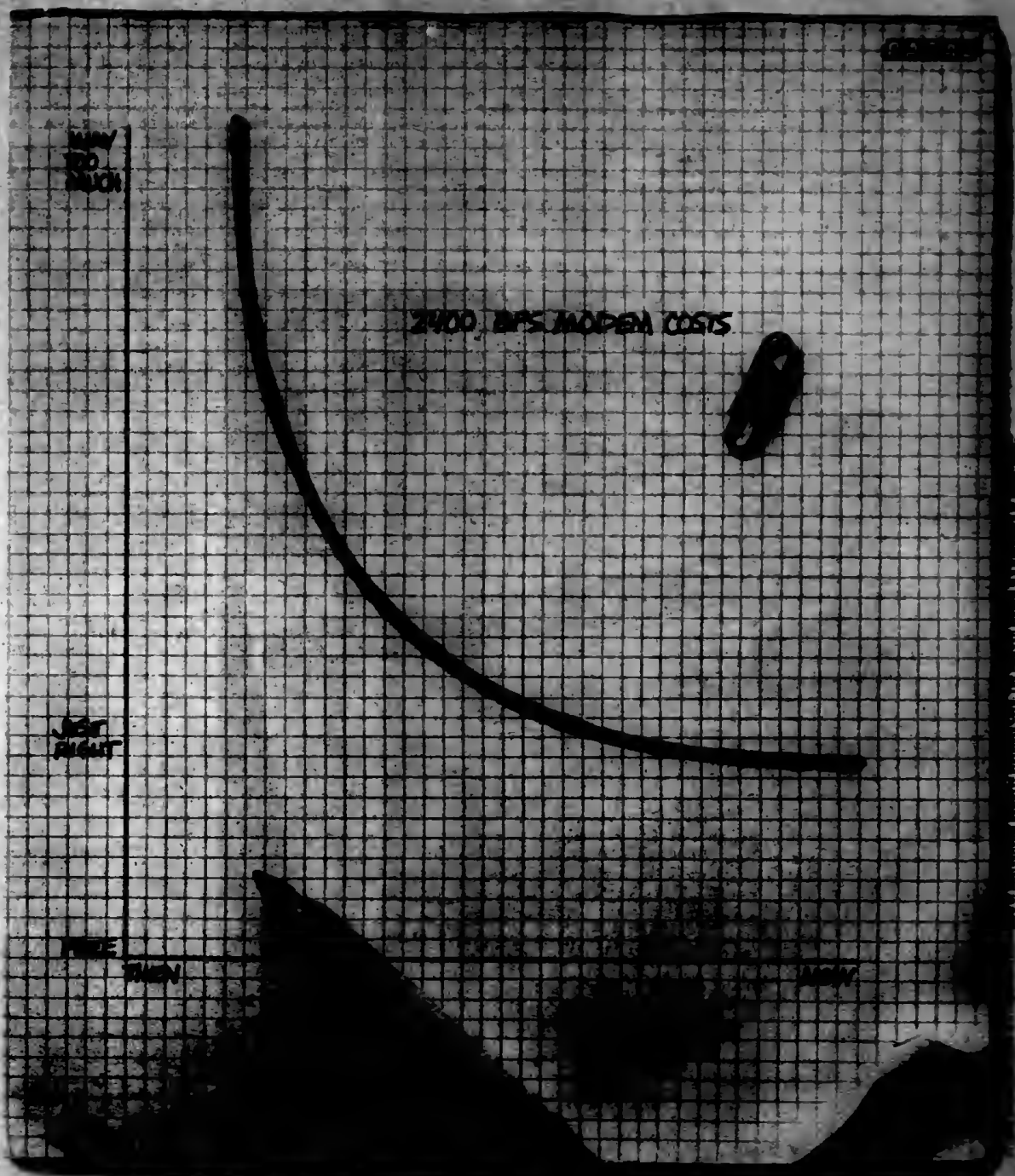
In fact, you'll find very attractive prices on all five of our 2400 bps modems.



Including our high-density rack-mount. An international modem. Two desktop types. One of which is our top-of-the-line model. It can down-line load and store dialing directories, log-on sequences and security passwords. And offers switch-selectable synchronous/asynchronous communications.

There's even a new internal modem for the IBM® PC that's so uncomplicated even the person who wrote this ad can use it.

They all offer standard



features like remote diagnostics, automatic dialing directories and complete unattended operation.

But unlike other 2400 bps modems, all ours switch automatically between 2400, 1200 and 300 bps. So you can keep in touch with those less far-sighted than yourself.

Now that you've had a look at the future, here's how to get there.

Call 800-543-3000, Operator 507. In California, 408-946-2227.

Or write if you have the time. Racal-Vadic, 1525 McCarthy Blvd., Milpitas, CA 95035.

Racal-Vadic

Makers of The Maxwell Modem.™

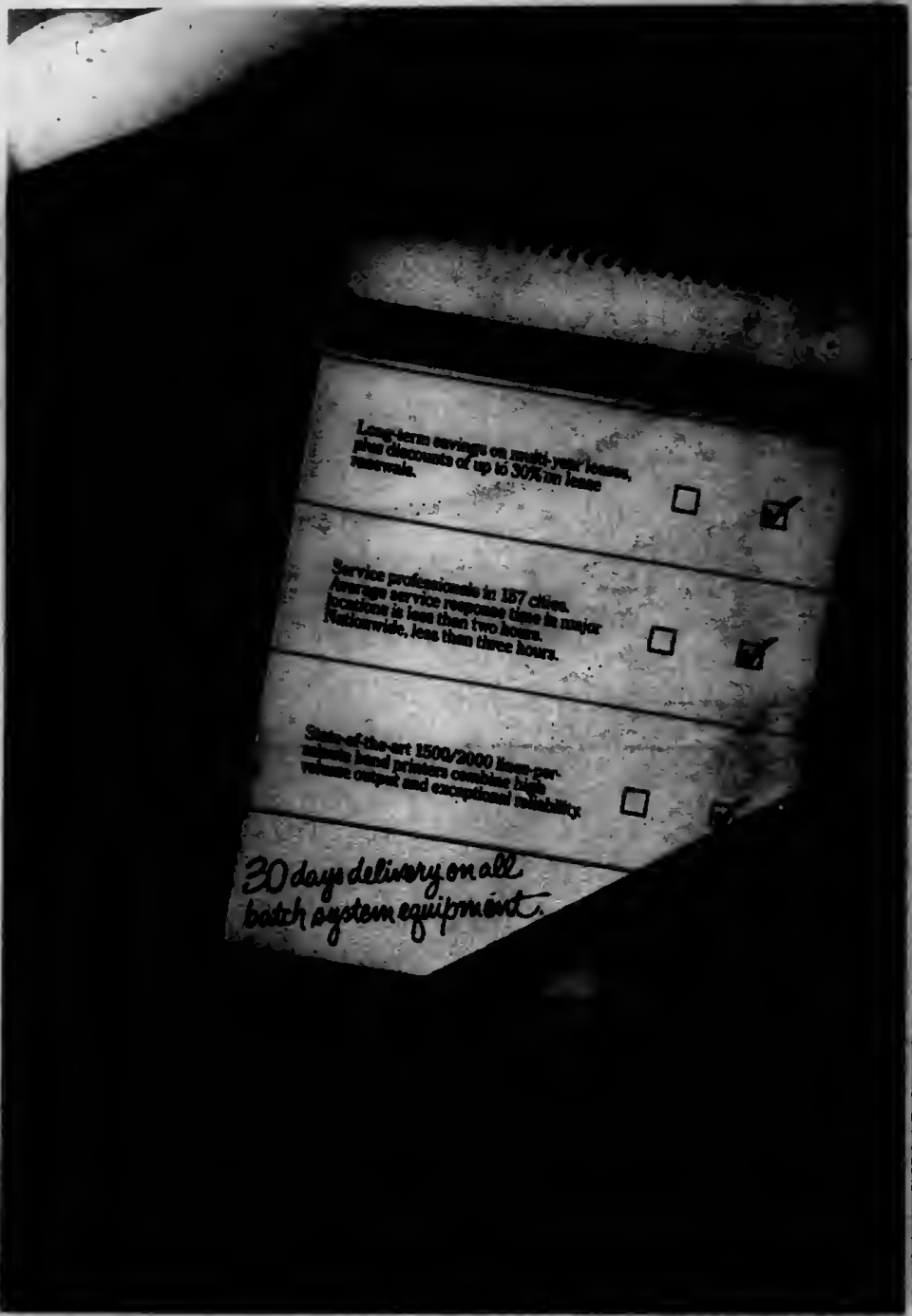
support system unfeasible. Smokestack was able to establish a management reporting system and then a budget model only after the data requirements between divisions had been standardized and the consolidated reporting system needed for the data base was established.

With communications-oriented executive support systems, the executives need to be linked with the people with whom they communicate. If the people in the executive's communications community do not use or are not on the system, then the executive cannot gain the benefits of using such efficiency-oriented communications tools as electronic mail. At both Manuco and Toy, it was found that executives communicated downward to their subordinates. Support systems were organized horizontally to other executives, and subordinates were not originally on the system. The structure limited the systems' potential utility.

Manuco provides a good example of what occurs when data bases cannot be compared or utilized across different groups. The firm had more than 50 separate divisional and staff data bases, but they could not be used in concert. This situation caused considerable difficulty for the policy-oriented group executives, who complained that the executive support systems could only be of help to them in their work if they could utilize and compare information across divisions and groups. This example illustrates why three of the firms spent considerable time and effort in selecting data base management systems that created relational data bases.

The data bases for executive support systems are often, though not exclusively, extracts of corporate transaction systems. During the institutionalization period, executive support systems diffuse into other divisions and staffs, and usage within corporate subgroups increases. It is necessary to establish corporatewide systems that allow for easy transfer of data.

Two firms that reached the institutionalization stage have approached the problem of standardization by establishing corporate data warehouses from which data can be extracted for individual support systems and setting up common data base management systems that all divisions and subsidiaries must use.



Managing resistance

Resistance to new technology is a normal phenomenon. It can be either an act to protect one's domain or simply a reluctance to change without proof that a new way is better. Resistance to executive support systems occurred during the installation period in all the companies studied. It took the form of avoiding the system, actively resisting it and withholding. Resistance can slow down or cripple installation of an executive support system. Where the executive support systems were installed well, resistance was effectively managed.

In efficiency-based systems, the resistance took the form of nonusage. Toy Electric provided a good example of this passive resistance. The executives already had good support in place: secretaries to pass and screen their messages and administrative assistants to do budgets.

The resistance was expressed by both secretaries and executives. In responding to questionnaires, they said the system was fine and asked for minor modifications, but they didn't use it, because the questionnaires addressed interface rather than compatibility or work issues. In this way, the systems satisfied the perceived desire of the CEO to provide a personal management tool, and then the staff proceeded to work as they liked. At Wellness, the problem of nonusage was dealt with by the president himself, who invited other executives to attend training sessions with him.

Active resistance was evident at Smokestack. The decision support group developed an easy-to-use query system for the vice-president of personnel. He used the system for three weeks and then gave it to his own systems person to operate. The systems person claimed that the new system was inadequate and not as complete as the complex personnel information system already in existence. He was, however, the only one in the corporation who could operate the older system; the new, sim-

MCBA introduces shrink-to-fit software.

With nine years in minicomputer software, 15,000 installations worldwide and an established reputation in the mini world, MCBA is proudly shrinking its software line.

Down to micro size.

We've taken the impressive power of minicomputer software and made it available for micros. Right now.

Alter the fit? Absolutely.

Alter the functionality, modularity and capability? Not one bit...so to speak.

This new line of serious microcomputer software is by far the most comprehensive, well-tested and sophisticated in the industry today. By whose standards? Thousands of MCBA users who rank it the best in the business.

MCBA's library of 16 integrated manufacturing, distribution and accounting packages can be installed in whatever combination and sequence a user needs for his or her business.

It grows with businesses. No matter what size they are now. Or want to be later.

And MCBA software now runs in RM/COS,® PC-DOS, UNIX,™ and UNIX look-alike environments.

In other words, we've tailor-made our newest software to fit micros—as comfortably as it fits user needs.

So whether you're a dealer or a user, find out about it. Call 1-800-MCBA NOW (toll free outside of California). In California, call (818) 957-2900.

MCBA's shrink-to-fit software. For growing businesses.

MCBA

Minicomputer Software for Micros.

2441 Honolulu Avenue, Montrose, California 91020

Also for DEC, Wang, HP, TI, and Perkin-Elmer minis.

MCBA is a registered trademark of MCBA, Inc. UNIX is a trademark of AT&T. RM/COS is a registered trademark of Ryan-McFarland Corp.

pier system was usable by anyone.

A third form of resistance, withholding, is based on the "information is power" principle. At Manuco, the MIS people were unable to obtain several divisional data bases that would have been helpful to group executives in policy planning, because the divisions did not want their data on a common system.

At International, the divisional presidents were reluctant to provide information for the executive support systems because they thought their autonomy would be affected. A frank discussion about critical success factors was held between the divisional executive and group president, allowing resistance to be handled by negotiation. This is a good example of how resistance can be resolved. Because participation in designing the system was high, end users perceived it as a central tool to their success rather than an infringement on their autonomy.

There are definite patterns in the relationship between the number of elements that are managed well during the implementation process and the effectiveness of the executive support systems. Wellness and International had all the elements present early and promptly and have the most successful implementations to date. Manuco and Toy had the fewest elements, the most problems and ceased the implementation process prior to institutionalization.

Organizational change

Executive support systems are often a lever for organizational change. This change tends to be associated with a new leader's vision of how the organization should function. The executive support system becomes an extension of the leader. It is one of the tools he uses in bringing about a restructuring of the organizational mission. The reports and data in the executive support systems are the message to the rest of the organization as to what indicators count, and the staff members who manage the executive support systems become the gatekeepers of information.

The relationship of executive support and organizational change was clear in this sample. The three executives who sponsored effectiveness-oriented systems had been in their jobs less than a year. They all said that after spending several months getting accustomed to their jobs, they developed a vision of where they wanted to move the organization.

At International, Peter Dewey saw a need to focus the corporation on its future. This focus meant finding ways to communicate critical information to the top of the organization and to bring the divisions in his group into line with a strategic plan. Dewey perceived the firm as complacent because of past success and unrealistic about its future. He also felt that the changes had to be brought about carefully, since theirs was a long history of decentralization of the subsidiaries and no immediate crisis to justify participants' action. He was also conscious that as a group executive he had limited staff and it was not fruitful for him to become involved in the nitty-gritty operations of his divisions.

He saw his increase in effectiveness in being able to make his divisions and the upper management of the corporation focus on strategic planning. For Dewey, the presentation form of information became very important. He felt that graphics allowed people to see trends clearly and kept them from being buried in numbers and paper.

This picture fit the role he saw for himself as communicating crucial information and goals upward to the chairman and down to his divisions. He also used the critical success factors process in bringing his division presidents into agreement with the strategic plan and established a graphics reporting system linked to that plan. Dewey's vision was one that he saw as gradually moving International to its future rather than reacting to crisis.

At this point, the divisions have institutionalized reporting, which addresses the strategic goals.

When Paul Dawson assumed the helm at Wellness, he knew that the traditional sales orientation was not working any more. Dawson had a vision of changing Wellness into a firm that was analytically marketing based. Dawson established his executive support system with a marketing data base and simultaneously established a market research group directly below him to run the system. He changed the reward system for his managers from one that granted bonuses as they met quota on any products to one that required them to meet quota on all product lines.

In the last year, Dawson has restructured the division, amalgamating units and dropping product lines, forcing them to use the system. He has also focused his sales effort on a different market segment. In Dawson's case, the executive support system can be seen as one of the tools in a tool kit for changing the operation and culture of Wellness.

It is worth noting that a significant difference between the executive support systems that are business problem-based and linked to visions of change and those that are oriented to personal management and efficiency is that the communications-based systems are not driven by a vision of organizational change. This may make them more difficult to implement because the executive is actually viewing the system as office equipment, a typewriter or dictaphone, rather than as a central part of his business.

About the author

Eliot Levinson is a visiting scholar at the Center for Information Systems Research, Sloan School of Management, MIT.

To add markets as well as profits to your business, add Zaisan to your system.

The ES.1 voice/data workstation offers single-key access to simultaneous voice, data or text. With the touch of a button, users can also access internal and external databases, PBX functions and electronic mail.

The ES.1 is also upgradeable. So you can add application and communication software to tailor the ES.1 to the individual information needs of your users. Which can add sales to your business.

Another plus is the price. And the wide range of service options.

Add these all up and you'll see the formula for success is rather elementary. Add Zaisan.

13910 Champion Forest Drive. Houston, Texas 77069. 713.580.6191.

ZAISAN™ The new direction in business communications.

IN DEPTH

How to evaluate micro-based systems

By John Saunders
and Naomi Karten

To justify custom development for micro-based systems, the proposed project should be either highly unique (no packaged software available), very important to the organization (performance expectations exceed what packages normally provide) or both.

Information systems management and potential users often feel uneasy about exactly what role micros and micro-based systems should take in their organization. One sound approach is to consider a custom micro-based system for a particular application. A custom-developed system is defined here as any system that is the product of a project life cycle and that meets the unique requirements of the business for ease of use, documentation and compatibility.

The techniques and tools used during development could be as sophisticated as a high-level programming language like Pascal or C or as general-purpose as a financial modeling language. What really characterizes a custom-developed, micro-based system is the explicit recognition of the analysis, design and development stages of its creation.

Up to now, most of us have assumed that a micro best serves the needs of an individual. This

view recognizes that the micro can focus considerable processing power on a specific problem.

When used with general-purpose software, this power is easily applied to a wide range of specific needs. The analyst who works with a large amount of financial information can use a spreadsheet package every time he needs to prepare a worksheet. The manager who must prepare a large number of reports can rely on a word processing and graphics package to generate high-quality copy. In both cases, however, the user applies a general-purpose tool to the specific tasks he faces.

However, micros can also serve other purposes within an organization, extending beyond the specific requirements of an individual. One theory provides a four-way classification scheme for information systems. Gordon David, in his book *Management Information Systems*, describes all information systems within an organization as being either personal or public, as well as formal or informal. These classifications account for automated or manual, mainframe-based or micro-based systems.

Given the processing and memory capacity of micros, there is no reason they should not be applied to systems in the middle levels of the systems pyramid. This is particularly true in cases where a communications link can be established to the mainframe.

In terms of this classification scheme, an automated general ledger system would be a public, formal system in that it would serve the requirements of the organization in a formal manner. Similarly, the Rolodex file maintained by an employee is also an information system, but it would fall into the private, informal category. Such an information system clearly serves only the needs of the individual who uses it. The organization has no requirements for how the Rolodex is to be organized or maintained.

Micros have largely been relegated to the role of private, informal information systems within organizations. Most firms assume that users should have direct control over their use of a micro and that this view is appropriate since the tasks they perform are personal in this sense. The desire of some DP managers to reduce their applications backlog by sharing the burden with users drives this assumption. The assumption is encouraged by the easy availability of packaged software designed to help inexperienced users meet general needs. In a sense, the entire information center concept of supporting and advising users is intended to encourage direct user control of micros.

But while there may be strong incentives for organizations to encourage the use of micros to meet private requirements, there is no reason that micros cannot also be considered for certain public, formal systems. Keep in mind that the processing capacity of micro hardware has increased enormously in the last few years. The processor at the heart of the Apple Computer, Inc. Apple II could handle 300,000 to 400,000 instructions per second. The recently announced Motorola, Inc. MC68020, on the other hand, can process four to five million instructions per second, an increase of more than one order of magnitude in processing speed alone.

The instruction set of modern microprocessors has also become considerably more advanced, resulting in more compact and efficient programs. Similar progress has been made in main memory and disk storage capabilities. The results of these advances in technology are small machines that are in some ways as powerful as the mainframes and minicomputers of previous years.

One can think of the information systems in an organization as a pyramid. At the bottom lie the transaction processing systems, which account for the bulk of data processing within an organization and which have been the traditional realm of mainframes. At the top of the pyramid reside information requirements that are generally difficult to define and that are constantly changing. The need of a top executive to prepare a three-year business plan might fall into this category. Microcomputers used with packaged software have traditionally been applied to these kinds of decision support needs.

However, at the middle levels of the pyramid are systems that do not have the heavy transaction processing requirements of the lowest level and yet are more standardized and static than systems at the top level. These systems usually address control and short-term planning needs of a firm, take as input standard data from the transaction processing systems and produce reports that aggregate this data in a predefined way.

Given the processing and memory capacity of micros, there is no reason they should not be applied to systems in the middle levels of the pyramid. This is particularly true in cases where a communications link can be established to give the micro access to the mainframe data base for downloading information. What managers need to know, therefore, is

Realia COBOL. Migration without migraines.

Until recently, you had to abandon the business computer language when you developed microcomputer application software. The available micro COBOLs were inadequate—too limited, too slow. The best alternative—the XT/370 or AT/370 using IBM's COBOL—was very expensive and still too slow. To get acceptable performance, you had to retrain your programmers in Pascal or C.

Realia COBOL is the cure for such headaches.

Realia's compiler supports most IBM VS/COBOL and VS/COBOL II features, such as:

- COMP and COMP-3 data
- SELECT assignment names
- Multiple entry points
- GOBACK, EJECT, and SKIP statements
- Structured programming extensions of VS/COBOL II

You can download mainframe systems for development, maintenance, and testing. Productivity will soar.

You can compile faster with Realia COBOL than in most mainframe environments, even on floppy-based systems. Compile-time options allow cross-reference, brief and full code listings, and helpful features like subscript and decimal value checks.

Our interactive debugger lets you follow the program source, display and modify data, and set breakpoints using the normal optimized machine code.

The results are startling.

Our users report that their systems run up to 20 times faster when compiled by Realia COBOL. That's compared to our nearest micro competitor. The ratio is up to 100 times faster when compared to any of the others.

On the IBM PC AT, your programs can run at 370/148 to 370/158 speed. Realia's file system really makes your machine deliver, giving it a distinct edge over Pascal or C. Our indexed file system even has full key compression and buffer controls just like VSAM. The generated code is pure MS-DOS, so it can be run on most of the 8088/8086 machine family.

And you can sell your programs without paying us a royalty fee.

Realia COBOL is priced at $995, including one year of maintenance and upgrades. Subsequent maintenance and upgrade contracts are currently priced at $125/year/copy. Available for the IBM PC, PC XT, 3270 PC, PC AT, PC-compatibles, and the TANDY 2000.

Realia COBOL. What a relief.

IBM, IBM PC, PC XT, 3270 PC, XT/370, PC AT, and AT/370 are registered trademarks of International Business Machines Corporation. MS-DOS is a registered trademark of Microsoft Corporation.

Professional Software for the Personal Computer

REALIA INC.
10 South Riverside Plaza
Chicago, Illinois 60606
(312) 346-0642

Why people choose an IBM terminal in the first place is why people want IBM service...in the first place.

After all, who knows your IBM terminal better than we do?

For many of our terminals we offer IBM maintenance agreements with the choice of service that's best for you—at the price that's best for you. That's blue chip service from IBM.

Take our IBM 3178 general purpose display. Some 3178 customers enjoy the convenience of IBM on-site exchange. That's where we exchange a keyboard, for example, at your place.

Other customers prefer the low cost of our carry-in service available through our Service/Exchange Centers.

An IBM maintenance agreement offers you fast, effective service, IBM parts and, when necessary, the benefits of our technical support network.

Quality. Speed. Commitment. That's why an IBM maintenance agreement means blue chip service.

To find out more about the specific service offerings available for your IBM terminal, call 1 800 IBM-2468, Ext. 90.

Blue chip service from IBM

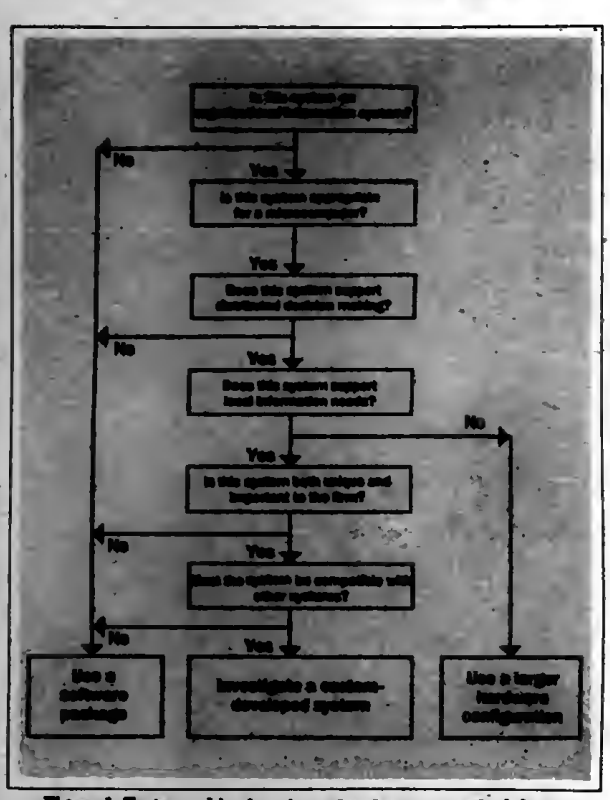


Figure 1. Tests used in choosing a development methodology

how to determine when a micro is appropriate for such an application and how to approach the development of the system when that determination is made. The following sections describe a methodology for identifying systems that are public and formal in nature and good candidates for a micro-based system.

Identifying custom projects

How does one decide on a development strategy for a system that might be appropriate for a microcomputer? The answer is contained in a series of tests to which proposed applications can be put. For the purposes of these tests, the manager should assume that the menu of strategies includes developing a system on a microcomputer, acquiring a software package or using a larger computer with either a software package or a custom-designed system. Figure 1 outlines the test sequence.

1. Is the proposed application an organizational or a personal information system?

A personal information system is one that meets the needs of a single person by keeping track of data of interest only to that user and that performs functions designed and used only by that user.

Insofar as micro applications are concerned, a software package can certainly meet the truly individual needs of a manager.

If, however, the system uses data that is standardized across an organization or performs processing that is standardized across an organization, it may be thought of as an organizational information system and may require a custom development effort. In this case, the proposed application should be submitted to the next test.

The micro can be an effective tool for middle-level decision making because it focuses processing capacity where it is required.

2. Is this application appropriate for a microcomputer?

This question implies a number of further tests, as follows:

2a. Does the application support decision making that is highly distributed throughout the organization?

We must ask this question in order to filter out those projects that support very centralized information needs. Such centralized decision making (such as companywide financial reporting to a chief financial officer) often should be supported by a centralized data processing operation. At lower levels of an organization, however, decision making often relies on local information; centralizing the processing of such local information can slow the turnaround times of essential reports. The micro

CA/CICS.
FIVE WAYS TO GET CONTROL OF YOUR CICS NETWORK AND MAKE IT MORE USEFUL, MORE RELIABLE, MORE SECURE, AND MORE EFFICIENT.

CA-FLEXISCREEN
The industry's most efficient screen generation tool—fast, flexible, easy to use. Will greatly ease your programmers' work load.

CA-RAPS
Eliminates major system bottlenecks by allowing printing of power queue files at remote sites. Speeds report distribution as much as 10-fold.

CA-EZTEST/CICS
Automatic online testing and debugging facility that will save not just hours, but days. Menu-driven, self-teaching, and usable by even the most inexperienced programmers.

CA-JARS/CICS
Monitors CICS performance and provides complete job accounting. Pinpoints problems and lets you maintain maximum efficiency.

CA-SENTINEL
Provides both batch and online CICS protection in one product. Maintains data integrity. The proven effective way to achieve total data center security.

Get control of your CICS environment—call 800-645-3003 or (in NY) 516-333-6700 and ask for Dana Williams.

COMPUTER ASSOCIATES
Software Leadership Through Excellence

© 1984 Computer Associates International, Inc. 125 Jericho Turnpike, Jericho, NY 11753

ESS RELEASE 2 AVAILABLE NOW

The Best MAINFRAME ELECTRONIC SPREAD SHEET for VM/CMS and MVS/TSO.

Our NEW ESS release 2 features sorting, consolidation, color graphics and an external file interface. It's fast and powerful for ease in building spread sheets with thousands of rows and columns.

Satisfied users worldwide and in the Fortune 500 have proven the usefulness of ESS. ESS is compatible with LOTUS and VisiCalc files. ESS is easy to install – just load it – no additional program products or languages needed.

30 DAY FREE TRIAL

ESS gives all your terminal users access to personal computing capabilities for only $220 per month – just a fraction of the cost of one PC and spread sheet package.

Call us at

(213) 475-TRAX

For more information call or write:

TRAX

TRAX Softworks Inc.
10801 National Blvd., Los Angeles, CA 90064

VisiCalc is a registered trademark of VisiCorp
LOTUS is a registered trademark of Lotus Development Corp.

can be an effective tool for middle-level decision making, therefore, because it focuses processing capacity where it is required. The result is almost immediate availability of information.

There are other organizational advantages to decentralizing data processing capacity besides providing timely reports to local managers. For one, decentralization can sometimes enhance security of data maintained on a central computer. Suppose a small staff group is responsible for preparing a biweekly report to an executive committee and that this group relies on operating data read from tape on a central computer. A production manager in the same organization uses this operating data to make critical production decisions. There is always the possibility that the first group will inadvertently destroy or lose the operating data in manipulating it for the report. A system could be designed, however, to transfer the necessary operating data from the central computer to a micro and allow the staff group to make the manipulations it desires in preparing its report.

2b. Does the application support information needs that are highly localized?

This question should also filter out projects that support centralized information needs, as the previous question does. However, the question admits projects that are localized rather than distributed. Localized in this sense means projects that support information needs at only one location. For example, the marketing director of a small subsidiary company may manage his sales force in a way completely different from the managers of all other subsidiaries. His needs are local.

The example in the previous section also described a localized information processing need. Applications that are distributed represent identical information processing needs repeated at various points throughout an organization, usually at middle levels. It is quite possible, therefore, for a distributed application to be localized, although a localized application will not be distributed.

3. Is the application both unique and important?

This is a question of the marginal economics of a custom-developed vs. a packaged software approach to a problem. If the application is appropriate for a micro (as determined by the previous tests), then the next step is to determine if the benefits of a custom system will outweigh the costs.

One approach to this problem takes a qualitative perspective. It begins by mapping the project on a three-by-three matrix, which plots uniqueness vs. importance (see diagram on ID/17). In order to justify a custom development effort, the proposed project should be unique (in which case there will be no packaged software available for the application), very important to the organization (in which case the software must meet performance standards that exceed those of most packages) or both. In terms of the matrix, the project must fall in one of the three boxes on the upper right-hand corner in order to justify custom development.

In mapping the proposed project on this matrix, determining application uniqueness is simpler than determining importance. One might begin by determining the availability of packaged software to meet the needs of the application. This implies, naturally, that the requirements of the system are already well understood. In any case, it is generally true that the more unusual a given application, the less likely a packaged software product will be available for it. In making this determination of uniqueness, therefore, one might ask:

If the application is appropriate for a micro (as determined by testing), then the next step is to determine if the benefits of a custom system will outweigh the costs.

- Can functionality be added easily to a packaged product to meet changing user needs?
- Is the package compatible with other systems now in use in terms of data, input and output requirements?
- Can the package handle the size of data base required by this application?
- Does the package provide an appropriate user interface?
- Does the package have the processing speed necessary for this application?
- Will support be available for implementation and use?

If a package meets these or other appropriate criteria, it can be considered an alternative to custom development. Otherwise, the application may be viewed as unique. Compatibility is significant enough that it is treated as a separate test below.

Judging the relative importance of an application is a more difficult task. The extreme cases are often self-evident. For example, a claims processing system is critical to an insurance office, since no work can be accomplished without it. But the marginal cases are more difficult.

One approach relates the relative importance of a proposed system against systems already in operation. One might prepare a list of

HACKER PROOF

Have SECURE dial access to ANY computer using NO passwords and NO dialback with DATA LOCK & KEY™

Simply connect a **DATA LOCK** (shown above) between your mainframe and your modems. Issue the portable **DATA KEYS** (shown below) to all authorized personnel. Only these members of your staff can access your system—

from any telephone—and they need no passwords! They simply dial in, and are connected.

NO PASSWORDS?

Only a **DATA KEY** can provide correct responses to the large random numbers sent by the **DATA LOCK.** Thus the LOCK quickly identifies authorized users, and allows them to access the mainframe. Because the numbers are random, the dialogue between **LOCK** and **KEY** is different every time a user dials in.

Access is not dependent on passwords remembered, forgotten or passed along, so it is faster and more secure.

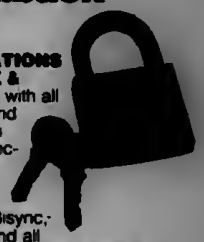
HACKERS, BEWARE.

DATA LOCK is ever-vigilant. Every unauthorized access attempt is immediately **detected, thwarted, displayed, printed and remembered.** Simultaneously, computer room personnel are alerted by a piercing alarm.

AUDITORS, REJOICE!

Just connect a printer to a **DATA LOCK** to obtain a comprehensive audit trail, which includes the following information:

- Date, time and details of all calls handled.
- Statistics of line usage
- Unauthorized **DATA KEYS** (i.e. lost or stolen **KEYS**).



SPECIFICATIONS

DATA LOCK & KEY™ works with all computers and modems with RS232 connections. The system is compatible with async, Bisync, SNA/SDLC and all other protocols. No adjustments are necessary for protocol, baud rate, modem type, etc. Protocols and mainframes of different types can be simultaneously supported by one **DATA LOCK.**

LINES SUPPORTED:
DATA LOCK—4
DATA KEY—1

DATA KEYS supported by DATA LOCK: any number.

PRICE: DATA LOCK—$4,000
DATA KEY—$400

Microframe Inc.
205 Livingston Ave
New Brunswick, NJ 08901
(201) 828-4499

With Exxon you never have to face it alone.

Exxon support people make sure I get what I need, when I need it.

We think the way your office automation equipment works out is just as important as the way it *works*. So at Exxon Office Systems we support you — in every step of your office automation program.

First, before we'll sell you any equipment, we perform a free needs analysis. Once you've made a commitment, we don't just deliver boxes to your door. We install your equipment for you, and then we train your staff to use it.

If you or they have any questions we have toll-free on-line support/service that works with you on similar equipment. And that support includes the immediate dispatch of service, if it's ever needed.

You see, at Exxon we're committed to office automation support that's so complete, it will face up to all your needs.

For additional information call 800-367-8888, or write Exxon Office Systems, P.O. Box 10184, Stamford, CT 06904-2184.

EXXON OFFICE SYSTEMS

The future...without the shock.

Figure 2. A micro-based order costing system

applications in use, ranging from customer billing to a spreadsheet package used by a manager to prepare budgets. Note that these systems need not all reside on a microcomputer, nor do they have to be computerized. It is only necessary that a reasonable range of discrete operations be compiled. The proposed project can then be ranked against operations in existence in order to determine how critical it actually is to the organization.

There are subtle ways in which the judgment of a system as relatively unique and important can interact. For example, the degree to which a project is highly distributed throughout an organization can affect its "importance." An application that would be used in all the marketing offices of an industrial equipment manufacturer would be more important to that firm than one that would appear in only one office. The application that is widely distributed would yield higher benefits in total productivity gains than an application that is extremely localized. Hence, all the issues of distribution, localization, uniqueness and importance must be considered within the analysis of the problem. That interaction should come out in this stage of the analysis.

4. Must the system be compatible with other systems in use?

This last criterion may be the one that most often justifies custom development efforts. Even if the proposed system is not unique and does not rate high in terms of importance to the organization, the requirement that it be compatible with other systems in that firm is often enough reason for custom development. "Compatible" means that the system uses data in the same format as the systems used by the organization as a whole, that it produces reports that appear in the same format as those of the organization, that it is able to communicate directly with the centralized data processing system of the organization and/or that the language in which it is constructed is the same as, and meets the standards of, the organization as a whole.

An example illustrates the notion that a micro-based application should serve needs that are localized and distributed throughout an organization. A manufacturer of industrial process control equipment marketed its products through a large number of local sales offices. These offices were staffed by sales engineers who worked closely with customers in helping them choose the proper equipment configuration for their needs.

Because the company produced thousands of individual items that could be combined in many ways, the process of preparing orders for the customer was time-consuming. It involved looking up all the items required by the customer, checking their compatibility and availability, finding their price and filling out a complicated worksheet.

Figure 3. A micro-based mutual fund reporting system

The firm addressed this problem by developing a micro-based system that could retrieve price and availability information from the mainframe and prepare an order costing sheet (see Figure 2). The system was used in each of the sales offices of the firm by the sales representatives. They could prepare a proposal for a customer based on the most recent price and availability information on the central system.

This arrangement decreased the time necessary to prepare proposals and allowed the sales staff to be much more responsive to customer needs.

The project met several of the criteria discussed in section two. The need for the application existed in each of the local sales offices of the company, making it distributed. The application was also quite specific to the parts list and pricing scheme of the firm. In fact, an early prototype developed using Ashton-Tate's Dbase-II turned out to be unbearably slow.

Finally, because of its wide distribution throughout the marketing organization of the company, the project was easily justified by the increase in productivity in each sales office. The system did not represent

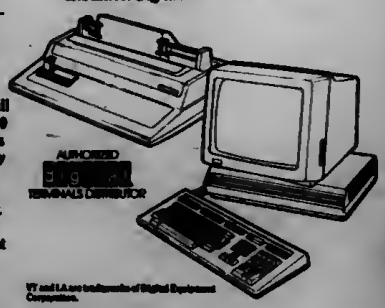
DJC
Recommends Digital Terminals

For Video Display And Printers There's No Name Like Digital

The VT™ 200 family sets a new standard in video terminals. Included are the VT 220 a conversational text only terminal; the VT 240, for text and interactive monochromatic business graphics; and the VT 241, featuring full color graphics. All are compatible with the popular VT 100 series.

Digital's family of printers can fill all your needs. The Letter Print 100 (LA™ 100) gives you three printers in one—draft quality, letter quality and graphics. The LA 50 Personal Printer adds efficient, low cost printing to any personal computer. These new Digital printers feature the same quality and reliability that made the LA 120 the top rated heavy duty Matrix printer in its class.

DJC stocks Digital, both videos and printers—so call DJC, the leader in peripheral distribution, and ask for Digital.



AUTHORIZED
Digital
TERMINALS DISTRIBUTOR

VT and LA are trademarks of Digital Equipment Corporation.

DJC CORPORATION
5700 Buckingham Parkway
Culver City, CA 90230

New Jersey (201) 780-0002
(800) 526-2003
Illinois (312) 798-4486
Texas (713) 541-8511
Colorado (303) 233-8236
Hawaii (808) 943-1944
California:
San Francisco (415) 364-8800
(800) 227-2510
Los Angeles (213) 410-8800
(800) 421-3000
Irvine (714) 851-8811
Florida:
Orlando (305) 859-2305
(800) 321-6000

a critical function for the firm in any sense. Orders were, and probably still are, prepared by hand. But the system had the potential for greatly reducing the time necessary for preparing proposals and orders for customers. The system also would standardize the ordering process and provide information to the manufacturing operation about sales much more quickly. Thus, the cumulative benefits of the system justified custom systems development.

The second case illustrates the opposite situation. An investment advisory firm tracked the performance of about 600 mutual funds and published its data in a newsletter. The data used in this activity included several measures calculated from current security price data. A small staff group carried out the calculations necessary in compiling these tables, using, in part, security price data read from pricing tapes. Another group within the firm also used these pricing tapes in managing clients' investment portfolios.

One firm, rather than add another function to its minicomputer, chose to build a custom mutual fund tracking system for a microcomputer. The system would be totally dedicated to the task of compiling biweekly performance data.

The firm felt that the job of compiling performance statistics should be automated. This would allow the staff greater freedom to pursue special analysis of the raw performance data. However, rather than develop the system for the minicomputer that read the pricing tapes and that the firm's portfolio managers used in their jobs, the company chose to build the mutual fund tracking system for a microcomputer (see Figure 3 on ID/23).

Both the system developed and the hardware would be totally dedicated to the task of compiling biweekly performance data. The system would download the necessary price information from the minicomputer to the micro, read other information from manual data entry, compile reports and allow the staff group to perform limited analysis of the basic information.

This system illustrates the virtue of placing a critical business function on a dedicated piece of hardware. The biweekly reports represented one of the most fundamental products sold by the company. This value in itself justifies a custom development effort. However, further justification was provided by the competition for pricing information between portfolio managers and the mutual funds tracking group. The importance of each of these activities argued strongly for separating their functions as much as possible.

Finally, since the work of the mutual funds group included some analysis of performance figures, the system had to allow for possible future enhancements. Even though the need for the application was extremely local, the critical nature of the application, the need for compatibility with other systems and the need for a modular design all required custom development.

In a final example, a large commercial bank recently decided to enter the municipal bond registration and transfer agent business. It already offered government banking services to municipalities, specifically by providing advice on the preparation and marketing of a new bond issue. In making the decision to enter the registration business, the bank also recognized a need for a high-quality system to support the service. Yet, while the bank realized that the volume of registrations it would handle was small and that a microcomputer could handle the required data base, it was unable to

IF YOU NEED A COMPUTER TO SORT OUT YOUR LEASING ALTERNATIVES,

WE HAVE A BETTER IDEA.

Phoenix Leasing now offers one stop lease shopping for IBM, IBM compatible, and IBM non-compatible computer systems and peripherals.

Configure your own system, *and* select your own lease plan, with terms ranging from 1-5 years for IBM and IBM compatible equipment and 3-5 years for IBM non-compatible equipment.

If our standard lease plans don't fit you, let us custom design one that does.

Contact Phoenix Leasing today. You'll find you don't need a computer to appreciate our flexible lease terms. We have a better idea for you.

1881 Francisco Blvd.
San Rafael, CA 94901

San Francisco (415) 485-4500
Boston (617) 890-7522
Atlanta (404) 572-2406

PHOENIX LEASING

A new standard in leasing. Flexibility.

Check us out

for DEC

and/or
DEC serviced compatibles
VAX 780, 750
11/73, 70, 44, 34, 23
All immediate & guaranteed
Everything from 11/23 to VAX

DATAWARE
SYSTEMS LEASE
800-221-6318
30 Bay St. S.I., N.Y. 10301
(212) 447-4911 TELEX 428384
TWX 710588-5738

DEC is a registered trademark of Digital Corporation

locate a suitable software package.

The bank met this need by specifying and building a microcomputer-based system to manage the process of registering municipal bonds and transferring the ownership of certificates. The system was built using such standard development tools as the C programming language, a commercially available data base management package and AT&T Bell Laboratories' Unix operating system. Unlike the previous examples, this system operated in isolation from other systems at the bank. It received all input through data entry operators in the bond registration area of the bank and produced all output locally, including all regular interest and principal payment checks.

This project met several of the requirements mentioned in the previous section. First, the application was critically important to the business of providing registration and transfer agent functions. In an important sense, the system that managed registrations and transfers was the business. The bank had a strong motivation, therefore, to seek out the most effective system it could find for this application.

Second, the application was unique in that no packages were available for mini and mainframe computers, but these were too large for the scope of the business the bank had in mind.

Finally, the operation was extremely localized. It was run by fewer than 10 professional and clerical staff. Information fed into the system from only one location in the bank, and processing took place in only one location.

There are many situations in which organizations should pursue a custom development strategy for micro-based systems. Demand for these systems exists in most industries, in all functional areas and at most organizational levels.

All these examples demonstrate that there are many situations in which organizations should pursue a custom development strategy for microcomputer-based systems. Demands for such systems exist in most industries, in all functional areas and at most levels of organizations. These systems are typically organizational and localized.

End users and MIS management must recognize that many information management problems have these characteristics and that microcomputers can accomplish a great deal more than run word processing and spreadsheet application software. Of course, many firms are coming to this realization, particularly now that hardware such as the IBM Personal Computer AT is available to support truly multiuser, multitasking systems.

Indeed, the potential of micro-based, multiuser systems suggests that we may see a reverse of the trend found in mainframe environments, which has been from custom to packaged software.

About the authors

John Saunders is a principal with the Boston Systems Group. He recently managed the development of a decentralized management system for a division of a large university.

Naomi Karten is president of Karten Associates in Randolph, Mass., and an associate of the Boston Systems Group. She consults to businesses and vendors on implementing and managing end-user computing.

ENCYCLOPEDIA

The UNIX System Encyclopedia is the largest available collection of information about the UNIX marketplace. Over 400 pages are filled with a comprehensive UNIX directory including 100 pages of manufacturer specifications and photographs, software reviews, and articles on the UNIX system.

☐ Please send me a copy of The UNIX System Encyclopedia $38.20 (includes $3.25 shipping and handling).

☐ CALIFORNIA RESIDENTS $40.48 (includes 6.5% sales tax).

☐ INTERNATIONAL $41.20 (includes $6.25 shipping and handling).

NAME _____

TITLE _____

COMPANY _____

STREET _____

CITY _____

STATE _____ ZIP _____

Yates Ventures
3350 Bayshore Rd., Suite 201
Palo Alto, CA 94303 (415) 424-8844

* UNIX is a trademark of Bell Laboratories

Columbia computers – we give you more than you pay for!

No other IBM™ compatible has more value to offer than we do – more hardware, more free software and more dealers coast to coast to serve you better.

While most computer companies are treading lightly today, Columbia's taking giant steps into '85. We've added a 10 MB hard disk portable at $3,495, that gives you three portable choices. We've got four desktops to choose from and for the demanding executive, we've recently introduced two fixed drive professionals with internal tape back-up. At Columbia things never looked better.

Look at Compatibility. Columbia's superior compatibility extends across the boards and across the spectrum of thousands of available software packages.

Look at Expandability. We offer more expansion slots and built-in ports. Our expansion slots give flexibility to add memory, data communications, multi functions and networking with IBM compatible PC boards. With our built-in ports you can add peripherals like modems, printers and plotters. We allow you to keep expanding as your needs expand.

Look at Performance. Our new 30M byte hard disk model with its 40 millisecond access time gives you performance where it counts, and we back it up with an internal tape system as well. Our new portable also features a hard disk giving it, too, peak performance.

The entire Columbia family of nine computers is field-proven with the most popular local area networking and data communication products on the market today, i.e., 3-COM ETHER SERIES,™ CORVUS OMNINET,™ IRMA,™ NOVELL NETWARE™/OS and NESTAR.™

Look at what you get if you buy by December 15th. Buy one of our dual drive Columbia computers by December 15th and you'll get with it a $2,500 software library which includes MS DOS 2.1, BASICA 2.0, word processing, spelling checker, filer, spreadsheet, database manager, home accounting, communications, colorgraphics, diagnostics and four ATI tutorials.

Plus when you buy any Columbia with at least 256K and two disk drives, you'll get free, OPEN ACCESS™ integrated software. OPEN ACCESS from SPI is a leading integrated software package that retails for $595.00. But for you it's absolutely free. You'll get information management, communications, spreadsheets, word processing, 3-D graphics and time management. This offer is available only at participating, authorized Columbia dealers.

Contact the nearest Columbia dealer in your area while he has Columbias in stock. With what we're giving away, he won't have it long.

COLUMBIA DATA PRODUCTS, INC.

The Family of Incomparable Compatibles

For the name of the Columbia dealer nearest you call:
800-638-7866

IBM is a registered trademark of International Business Machines Corporation. MS-DOS is a registered trademark of Microsoft Corporation. Open Access is a registered trademark of Software Products International. 3-COM ETHER SERIES is a registered trademark of 3-Com Corporation. CORVUS OMNINET is a registered trademark of Corvus Systems, Inc. IRMA is a registered trademark of Digital Communications Associates, Inc. NOVELL NETWARE is a registered trademark of Novell, Inc. NESTAR is a registered trademark of NESTAR Systems Incorporated.

Good things come in small packages.

The possibilities are endless with Northern Telecom's Displayphone-Plus™ — the business telephone and computer terminal all in one. If you need immediate access to records, schedules, data, and reminders, the Displayphone-Plus provides information from your own office computer as well as from hundreds of outside data bases.

Housing display, telephone, keyboard, and modem, the compact desktop unit offers fast installation by plugging directly into existing telephone jacks. Within minutes you have simultaneous voice and data at your fingertips.

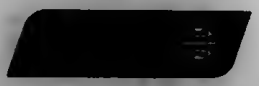
Features include:
Built-in 1200-baud modem. DEC VT100 plug compatibility. Selectable IBM or ANSI protocols. Centronics-compatible parallel port. Up to 32 user-defined functions. Dual voice lines with optional ring. Automatic answer and log-on for directory transmission plus manual mode for password security. Storage of up to 90 names and numbers for automatic dialing. Full-stroke retractable alphanumeric keyboard. Easy-to-read amber screen.

These combined features make the Displayphone-Plus the solution to your business and time management problems — both now and in the future.

Displayphone-Plus is a trademark of Northern Telecom Limited.

1. A full line of data communications and peripherals equipment!
2. Business and developmental software — plus a wide selection of data processing supplies!
3. Rental, leasing, and purchase plans for every need!

We deliver what you need.



CONTINENTAL RESOURCES, INC.

Corporate Headquarters
175 Middlesex Turnpike
Bedford, MA 01730

Boston Area
(617) 275-0550

Chicago Area
(312) 660-6661

New York, NY
(212) 695-3305

Baltimore — Washington DC
(301) 948-4310

Northern NJ Area
(201) 654-6900

San Francisco Area
(408) 727-6870

Philadelphia Area
(609) 234-5100

Los Angeles Area
(213) 639-0454

Dallas Area
(214) 469-7818

IN DEPTH

TO PATENT OR NOT

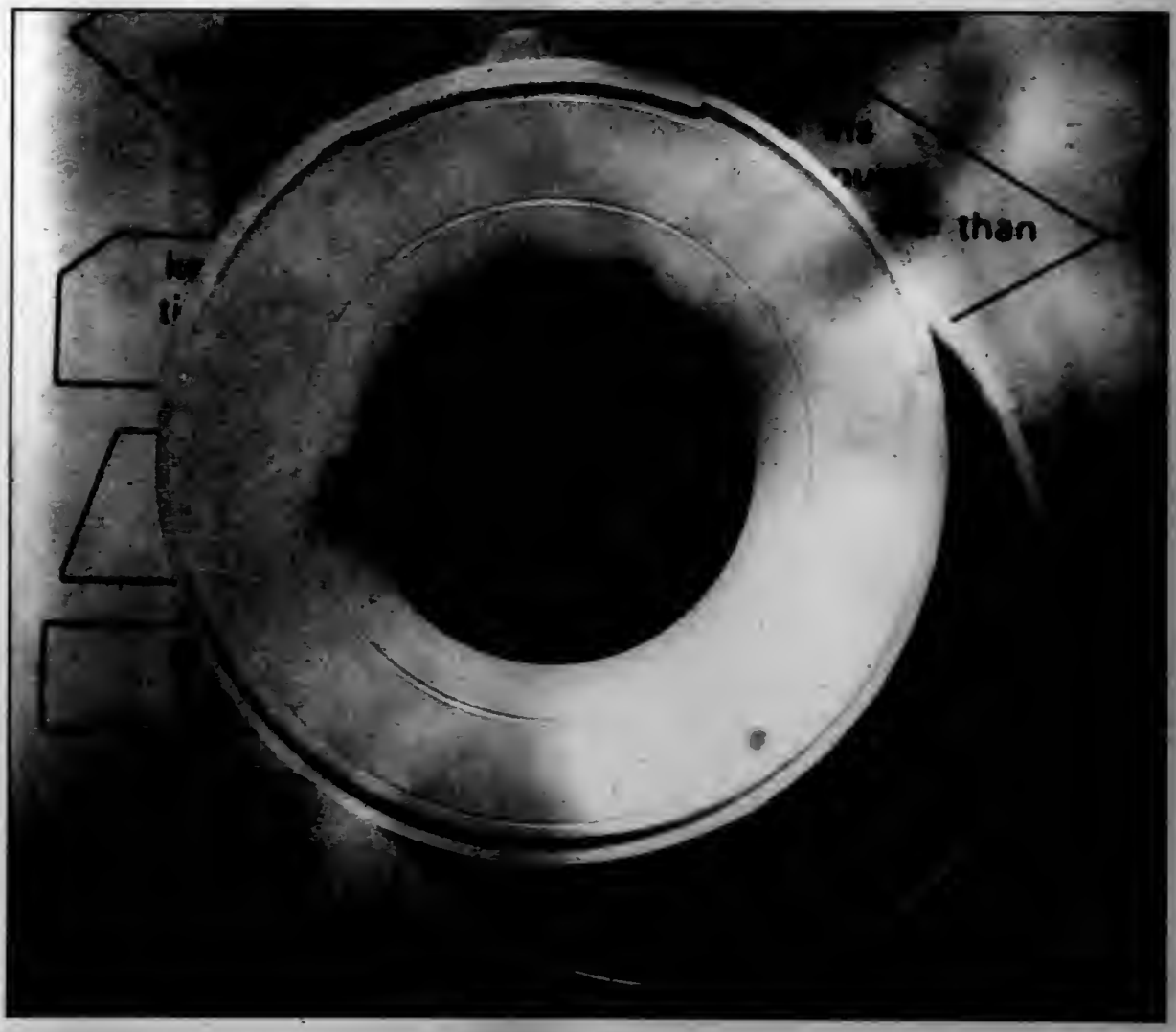
Trends in software protection

By Stephen Becker

Software patents are not for everyone. They protect only certain types of software and must pass a stringent examination process at the U.S. Patent and Trademark Office. They are expensive because in virtually all cases a patent attorney must be hired to do the work. In addition, the period of time required before the patent is granted is substantial. The process can take up to two years or more, and a patent has no teeth before it is granted. But once the patent is granted, it is formidable.

Unlike a copyright that covers only expression, a patent protects the concept behind your software. Whereas you must prove actual copying of your software by another person to show copyright infringement, patent infringement does not require copying; it covers competitive software that is independently developed after yours.

A trade secret must be a secret. Once your software becomes known to the public (and this can be done by a competitor who may reverse engineer your software), trade secret law is lost. Software protected by a patent, however, does not have to be maintained secret. Legal protection extends even to different but equivalent software that may have been written independently or by reverse engineering yours.



The New Cincom: 10 the only software ve

Finally, there's one software vendor offering a sophisticated software information network capable of meeting all of your corporate, departmental and personal information software needs—The New Cincom Systems. Organizations around the world are discovering that working with Cincom's integrated family of products enables them to greatly improve both performance and productivity. Here are just 10 of the many reasons why you should be considering the New Cincom software information network for your company:

#1 Relational Data Management Technology

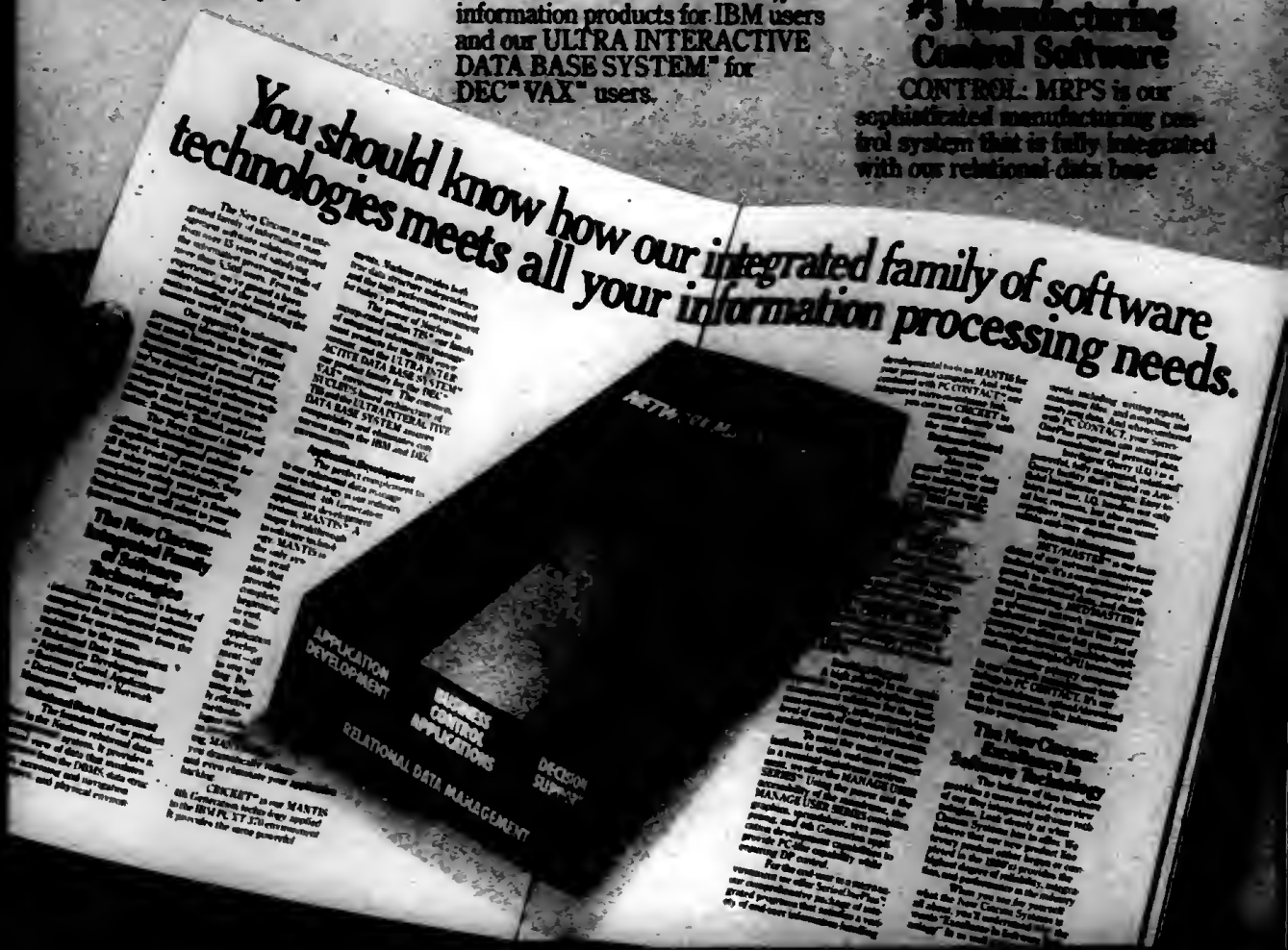
Powerful relational data management technology forms the "nucleus" of our software information network. Using a unique "Logical View" concept, all applications operate directly with "derived relational tables." As a result, we can provide complete data structure independence, as well as the high performance needed for today's production environments. This relational technology is the nucleus of both our TIS™ family of information products for IBM users and our ULTRA INTERACTIVE DATA BASE SYSTEM™ for DEC™ VAX™ users.

#2 Fourth Generation Application Development

The perfect complement to our relational data management technology is our industry acclaimed 4th Generation application development system, MANTIS™. In more than 1,500 complex production environments, MANTIS is dramatically reducing the application backlog through its powerful ability to "prototype," refine and commit the application to production in one interactive sitting.

#3 Manufacturing Control Software

CONTROL: MRPS is our sophisticated manufacturing control system that is fully integrated with our relational data base



reasons why we're ndor you'll ever need.

technology. A complete closed-loop system, MRPS is improving the productivity and profitability of over 125 IBM and DEC VAX manufacturing environments around the world.

#4 Financial Control Software

CONTROL: Financial is our sophisticated financial accounting and control system which molds to the way you do business. Integrated directly with MRPS, CONTROL: Financial includes Accounts Receivable and Credit Management systems with Accounts Payable soon to follow.

#5 Advanced Network Management

NET/MASTER™ is one of the most recent additions to the New Cincom family of integrated products. Very simply, NET/MASTER is an advanced network management system that takes the complexity out of managing a sophisticated IBM computer network and lays the groundwork for distributed data base processing.

#6 The Interactive Mainframe—Micro Link

Further expanding the capabilities of our software information network is PC CONTACT, our mainframe-micro link which enables users to interactively upload/download data between the mainframe and IBM PC's. PC CONTACT gives the PC user the ability to access multiple file types stored in the corporate data base for Decision Support manipulation.

#7 Micro Decision Support Software

For comprehensive micro-level Decision Support we offer SeriesOnePlus™*. SeriesOnePlus includes file management, spreadsheet, graphics, reporting and word processing components that are all integrated through a unique "BUS" architecture. Because the system is designed exclusively for business situations, SeriesOnePlus complements any mainframe-micro network strategy.

#8 Mainframe Decision Support Software

The recently introduced MANAGE USER SERIES™ provides powerful Decision Support capabilities for the mainframe user. The MANAGE USER SERIES combines graphics, spreadsheet, text processing and application development tools to enhance the use and display of corporate data.

#9 Client Support

The one thing that isn't new about Cincom is our unrivaled commitment to service, support and user education. When you choose Cincom you can be assured of the highest caliber of support.

#10 Software Excellence

Why the New Cincom? Well, we like [illegible] of ourselves as the New [illegible] every product [illegible] information network has been released since [illegible] we believe our new products provide the highest degree of reliability, integration, performance and value in the industry. As proof, just look at our sales. From 1982 to 1983, TIS sales rose 136%, MANTIS sales rose 50%, and MRPS sales rose by 45%. For even more proof we invite you to personally compare our products with what our competitors are offering. Then you'll understand why the words "Excellence in Software Technology" fit so well under our name.

To Learn Even More About Cincom Call Or Write For Our Brochure: "THE NEW CINCOM: WHAT EVERY INFORMED SOFTWARE BUYER SHOULD KNOW."

Cincom Systems Inc.
2300 Montana Avenue
Cincinnati, Ohio 45211
Attention: Marketing Services Department

1-800-543-3010
In Ohio: 513-661-6000
In Canada: 416-279-4220

Name _____
Title _____
Company _____
Address _____
City _____ State _____
Zip _____ Phone _____

Cincom Systems

Excellence in software technology.

CW 11/26

A patent is a right granted by the government to an inventor to exclude others from making, using or selling the patented invention in the U.S. for a 17-year period. Thereafter, the public owns the invention. In exchange, the inventor must make a complete disclosure of the invention in a patent application that is published after the patent is granted.

During the period of time when the patent application is being examined at the U.S. Patent and Trademark Office, the invention is maintained in secrecy; there is absolutely no way for the public to gain access to the information in your patent application before it is granted.

Suitable disclosure

Probably the best type of disclosure on computer software is a complete flowchart together with commentary describing the type of computer hardware used with software, the nature of the input signals to which the software responds and the types of output signals generated. A patent attorney will prepare all the necessary documentation for the patent application, but you will have to spend quite a bit of time with your attorney developing a suitable patent disclosure.

Patent attorneys must be registered with the Patent and Trademark Office. You can obtain the names of patent attorneys in your area by writing the U.S. Patent and Trademark Office, Washington, D.C. 20231. Be sure to select an attorney who has had experience with software-related cases.

A patent covers only subject matter that is new and is not obvious from what has been done before. Your patent attorney will have a search made at the Patent and Trademark Office to determine whether your software invention appears to be patentable before a patent application is prepared. You must work closely with your attorney to prepare the patent application because you will probably be more familiar with the technology.

After the application is filed at the Patent and Trademark Office, a patent examiner who specializes in software-related inventions makes a search of his records to determine whether your invention is patentable. You will, in a sense, also be working with the patent examiner, showing him the closest software to yours of which you are aware, reviewing what the examiner locates during his search and, with the help of your attorney, negotiating the scope of your patent.

Patents on software

In the past, there has been quite a bit of controversy over whether software or systems involving software are patentable. The problem is that certain types of subject matter resembling software have been determined by the courts to be incapable of being patented. For example, it is not possible to patent a mathematical algorithm or equation, such as the Pythagorean theorem, although it is possible to obtain a patent on a process or machine that in some way applies that theorem.

It is also not possible to patent a mental process, a method of doing business or a scientific principle. Early court cases were pro-software, finding ways whenever possible to justify patenting computer-related inventions.

Then, in 1972, the U.S. Supreme Court issued an adverse decision in a case involving a program for numerical conversion on the grounds that an invention involving a mathematical algorithm that has no practical application except in connection with a digital computer is not patentable because patents of this type would effectively preempt use of pure mathematics.

There was a concern in the legal community that computer programs, which

Reactive or resourceful?

Action rather than reaction marks the resourceful and successful manager. As an MIS/DP specialist, you can anticipate the needs of your colleagues and act in your company's best interests by introducing Dow Jones News/Retrieval® into your corporation.

Dow Jones News/Retrieval can be accessed with most standard time-sharing terminals, personal computers or word processors with communications capability. . .or even integrated into your office automation systems.

It's one way to be certain any manager and staff member, in any department, can have the reliable business and financial news, corporate analyses and economic forecasts needed to anticipate and respond quickly to opportunities for growth and profits.

Dow Jones News/Retrieval is a powerful, versatile, time-saving and, above all, extremely easy-to-use information resource that has application at every level of corporate activity. It will give your entire management team an immediately accessible selection of high-quality data bases they can use to solve problems, analyze trends and increase productivity.

Only Dow Jones News/Retrieval provides instant electronic access to *The Wall Street Journal, Barron's*, the Dow Jones News Service *and* Dow Jones Current and Historical Quotes that are continuously monitored for accuracy by our staff.

Dow Jones News/Retrieval can even accommodate departmental usage billing if you wish.

Users may also purchase Spreadsheet Link, the Dow Jones Software package that allows you to download data from Dow Jones News/Retrieval into three of the leading spreadsheets: Visicalc®, Lotus™ 1-2-3™ and Multiplan®.

For every action there's a reaction. Call Dow Jones News/Retrieval right now and watch your colleagues applaud a very smart decision.

For full details, call Eric Bradshaw, National Sales Manager, during office hours at (609) 452-2000, Ext. 2678.

DOW JONES NEWS/RETRIEVAL®

Copyright © 1984 Dow Jones and Company, Inc. All Rights Reserved. Dow Jones News/Retrieval® is a registered trademark of Dow Jones and Company, Inc.

CALL ERIC BRADSHAW AT 609 452 2000 EXT. 2678

IBM/38-36 INFO CENTER. TODAY!

PC INTERFACE AVAILABLE

Call or write for details on FUSION's Information Center. Includes integrated retrieval processor (report/queries), personal database and IBM PC Interface.

FUSION

FUSION PRODUCTS INT'L

(415) 461-4760

900 LARKSPUR L.C. #295
LARKSPUR, CA 94939
TELEX 176000

Dean Witter Reynolds attacked the validity of the patent on the grounds that the patent is a method of doing business that traditionally is unpatentable subject matter.

by their nature involve algorithms, are not patentable and that processes and machines involving programs are also not patentable. For a time, some attorneys were actually converting software into hard-wired circuits in patent disclosures to avoid rejections by the patent examiner. It became unclear whether at one extreme all inventions involving software of any type were unpatentable or, at the opposite extreme, only mathematical algorithms were unpatentable. This situation created quite a bit of confusion that was resolved only recently.

In 1981, the Supreme Court heard a patent case involving a program used in a rubber curing system. The temperature at various points within a mold was measured and supplied to a programmed computer. The computer processed the temperature measurements using a mathematical equation to open the mold at the exact time for optimum curing. The Supreme Court held the invention to be patentable, reopening the door to software-related patents.

To determine what types of software inventions may be patentable, the court used a test adopted from a lower court. The patent claim must first be analyzed to determine whether it recites a mathematical algorithm. If the claim does not recite (directly or indirectly) a mathematical algorithm, then the invention is patentable if it is new and not obvious over what has been done before. If the claim involves a mathematical algorithm, however, the invention nevertheless may be patentable if the claim does not completely preempt that algorithm. In other words, as in the rubber curing case, which involved measuring temperatures and opening a mold, there must be something in the software that goes beyond merely solving a mathematical algorithm.

The Patent and Trademark Office recently issued program patent examining guidelines endorsing the judicial test. Rather than dwelling on the types of software inventions that are not patentable, the guidelines instruct the examiners how to determine whether the software is new and unobvious and whether the patent disclosure is adequate.

Numerous patents have recently been issued on software inventions of various types. Last year, the District Court of Delaware reviewed a case between Merrill Lynch, Pierce, Fenner and Smith, Inc. and Dean Witter Reynolds, Inc. on a patent owned by Merrill Lynch covering its Cash Management Account program.

Dean Witter Reynolds attacked the validity of the patent on the grounds that the patent is a method of doing business that traditionally is unpatentable subject matter. However, the District Court of Delaware held the patent to be valid because the invention is a machine (programmed computer) and not a business method. The focus of the analysis must be on what the system is (a programmed computer), not on the use to which it is put.

In my opinion, the Merrill Lynch case goes too far. The categories of inventions, such as business methods, traditionally considered unpatentable, should not become patentable merely because they are practiced by a computer rather than by a human being. Nevertheless, the Merrill Lynch case has not, to my knowledge, been appealed, and the patent is being widely licensed.

Patents like the Merrill Lynch one are now being granted routinely by the Patent and Trademark Office. Unless there is a shift in the law, the

Uptime

Provide 24 hour CICS access

CICS Dynamic File Allocation is a must for effective CICS scheduling. It is the gateway to non-stop, round-the-clock CICS systems. It eliminates batch update crosshairs. It guarantees bullet proof restarts. It allows you and your batch jobs to add and remove CICS files at will, without disrupting your user community. Site license $3,000.

Browse CICS dumps on-line

The CICS Dump Display Facility provides immediate access to CICS dumps. CDDF is a no overhead "monitor" for production failures and test system abends. Selective dumps are completely formatted for CRTs and, the dumps can be printed immediately. Site license $3,000.

Notes International, Inc.
P.O. Box 10000 • Dallas, TX 75216
214 324-0000 • Telex 00-0000

Finally, an on-line COM printer that isn't a pain in the mainframe.

If there's one thing you don't need, it's an on-line COM printer that makes you alter your host computer's software. Unfortunately, that's exactly what most systems make you do.

All software for Bell & Howell COM systems is run on a built-in minicomputer. You won't have to interfere with your host computer's software.

But not Bell & Howell. We found a way to eliminate the problem completely: Software control of our Series 6600 COM printers is through an intelligent preprocessor. You won't have to make even a single modification to your host software because the preprocessor's minicomputer takes care of everything.

It can handle microfiche production. Create and maintain job setups. And even produce audit trails. All at the same time.

About the only thing your operators need to do is enter a few simple English language commands on the keyboard. If problems occur, the 6600's software tells them what to do next.

Of course, software isn't the only thing that's convenient with Bell & Howell. Since our systems operate off-line, as well as on-line, they give you total flexibility for job scheduling.

What's more, both our 6600 archival processing system and 6650 dry system run up to twice as fast as other in-house COM printers. And since they both have totally self-contained processors, there's none of the mess you get with other types of systems.

For more information on the COM printer that's a pleasure instead of a pain, call our marketing manager toll-free at (800) 538-4000.

In California, call collect, (714) 660-1050.
In Canada, (416) 746-2200.

COM

BELL & HOWELL
COM DIVISION

patents will be enforced in the courts.

In addition to the expense and length of time involved in obtaining a patent, the majority of software is not patentable despite liberalization of the law, because the software is not inventive enough. Most software, such as accounting programs, is just a rehash of functions previously done manually, only faster.

There is no guarantee that despite your attorney's best efforts, a patent will ever be issued. The examiner may simply refuse to grant the patent because he considers the software invention to be unpatentable.

Patent pending

Even if you appeal, you may lose. Although you can identify your program as having a "patent pending" while your patent application is before the examiner — and this may discourage some potential competitors — you have no real legal right until the patent is actually granted.

Patents are often criticized as being no more than "licenses to sue." An infringer might contest the validity of your patent in court, as Dean Witter Reynolds did in the Merrill Lynch case, and it is extremely expensive to defend a patent case. Statistically, as many as one-half of all patents that are challenged in court have been found unpatentable (patent opponents like to flaunt this), and appeal has been unreliable since the attitudes of various appellate courts have varied substantially.

On the other hand, fewer than 1% of all patents that are issued are ever litigated. It is only the weakest patents that are litigated; most cases involving the remaining patents are settled out of court. Although only about one-half the patents that are challenged in court survive, remember that in virtually any area of litigation half the parties win and half lose.

A practical problem with software patents is that they are difficult to examine properly. How do you determine whether software is new and unobvious? All software that is maintained as a trade secret and most software in the public domain is not in the files of the Patent and Trademark Office. Bearing in mind that the patent examiner has only several hours to do research, how does he locate and determine how prior software operates, particularly if no flowcharts are available?

This limitation is one reason that the Patent and Trademark Office previously opposed patentability of software inventions. During litigation, however, your opponent may have the resources to hire a small army of attorneys and experts to attempt to locate earlier software as evidence that your patent is invalid.

Brighter days

Despite various problems, software-related patents are becoming stronger and more widely used. Patent attorneys are becoming more proficient at drafting software patent applications, and the Patent and Trademark Office has hired a battery of new computer expert examiners. Although patents will never be perfect because all prior software, some protected by trade secrets, will never be before the examiners, new techniques for searching the software literature using data bases are being adopted by the Patent and Trademark Office.

Patent appeals have been consolidated into a single court, the Court of Appeals for the Federal Circuit, which tends to be more propatent than the Circuit Court that previously heard appeals. Patents are now more likely to be enforced, and a consistent body of laws will be established.

Because patents are expensive and will not be appropriate in every case, you should consider patent protection only for software that meets all of the following conditions:

- A commercial lifetime greater than about five years.
- Substantial commercial value.
- It involves more than the solution of a mathematical equation.
- It is clearly novel and unobvious — not a rehash of manual procedures, such as bookkeeping.
- It embodies a concept that is likely to be copied. ‡

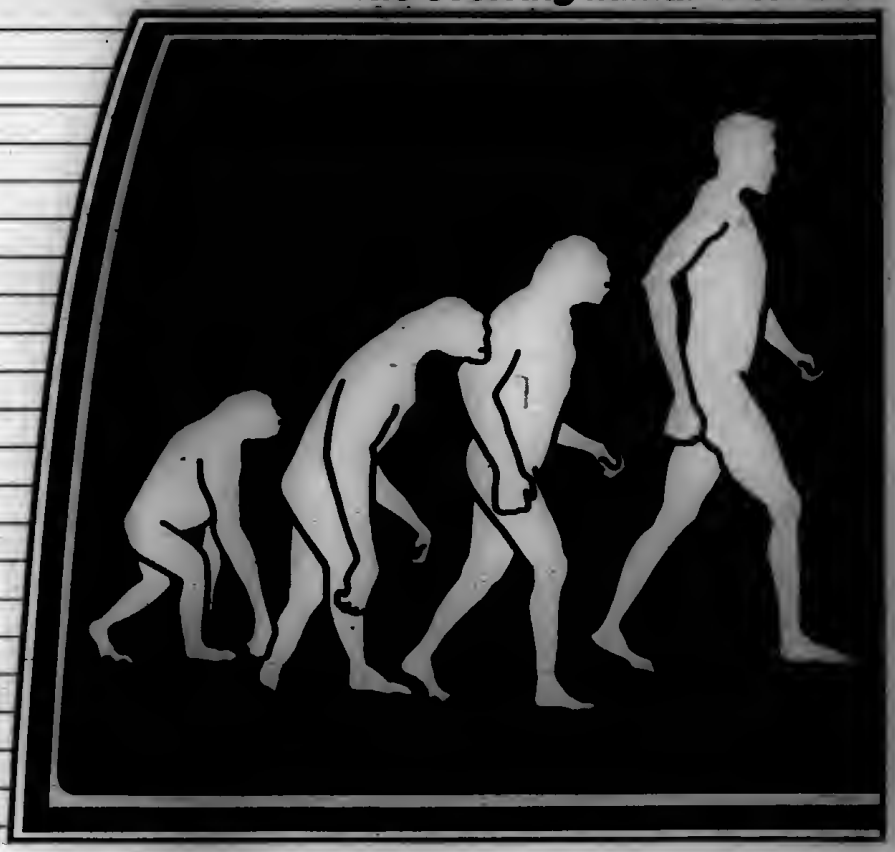
About the author

Stephen Becker is a patent attorney with Lowe, King, Price & Becker in Arlington, Va. He specializes in computers and software.

SPECIAL REPORT

Data communications terminals

The evolving human interface



November 26, 1984

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Daunted by bouts with micros, terminals look for niche

By Tom Henkel
CW Staff

The days of the traditional CRT terminal — a unit with little or no intelligence used solely to communicate with a large computer system — appear to be dying. The popularity of desktop microcomputers and the availability of inexpensive off-the-shelf components have permanently altered the way many organizations view data processing. Consequently, there has been an increased user demand for local processing power plus the ability to access data stored in a host processor easily.

But while most industry watchers agree the traditional role of CRT terminals has been irreparably changed, there still is considerable disagreement over when the market for relatively unsophisticated terminals will breathe its last. Some analysts say the demand for microcomputers has already severely limited the use of CRT terminals. Others, however, maintain there is still a huge market for inexpensive CRT terminals, especially among clerical workers who do not really need local processing capabilities.

"People forget just how many terminals there are out there," noted Melody M. Johnson, an analyst with the Seattle brokerage firm of Cable, Howse & Ragen. Just the replacement market for popular terminals like Digital Equipment Corp. VT100 and IBM 3270-type units could generate enough business to keep the industry alive for several more years.

The price gap

Furthermore, Johnson noted, there is still a considerable rift between the price for an unsophisticated terminal and microcomputer systems. That gap is large enough to cause many companies to think twice about putting a micro on every desk.

Bene Goldman, an analyst with International Data Corp. (IDC), a Framingham, Mass.-based market research firm, noted that an IBM 3270-type terminal can cost roughly half as much as a well-configured microcomputer. Goldman added that many companies, such as banks and insurance firms, use terminals mainly as a means to give workers access to data stored in a host mainframe.

For those users, there is little need for local processing capabilities, Goldman said, adding that few companies are willing to spend extra money to give employees capabilities they do not really need.

Johnson explained the trend toward desktop microcomputers has been very application-specific. For executives and secretaries who need to perform a variety of tasks, microcomputers have been a boon. But for clerical jobs, such as data entry, few companies have switched to using microcomputers over terminals. In fact, Johnson explained, many microcomputer companies don't know how to sell their products for so-called "back-office" applications.

The cost difference between terminals and microcomputers may be a temporary issue, noted Kenneth Bosomworth, president of Norwalk, Conn.-based International Resource Development, Inc. (IRD). Bosomworth said successful microcomputer makers are quickly building sufficient economies of scale into their manufacturing operations to negate the cost difference between terminals and microcomputers.

For example, even though a microcomputer tends to use more expensive components than standard terminals, Bosomworth explained that the microcomputer vendor capable of producing 100,000 processors a month may be able to sell the systems at a lower cost than a terminal manufacturer who makes 10,000 units a month. Currently, Bosomworth said some low-end microcomputers are already priced to compete favorably with terminals.

The popularity of desktop microcomputers and the availability of inexpensive off-the-shelf components have permanently altered the way many organizations view DP.

But the disadvantage of bargain-basement micros is that they often do not allow users to switch between local processing and terminal modes easily. Some, Bosomworth explained, require users to load communications software onto the system before the unit can be used as a terminal. Bosomworth said users must be able to switch easily between terminal and local processing sessions for the micro to be convenient.

He also said most microcomputer vendors could, and probably will, adapt their products to include the communications software in read-only memory. This would allow the user to choose either a terminal or local processing mode by flipping a switch.

One solution to the terminal/microcomputer issue is a hybrid product that offers both microcomputer capabilities as well as easy access to a mainframe in a terminal mode. IDC's Goldman noted IBM's 3270 Personal Computer offers such hybrid capabilities, but the unit is still more expensive than some 3270-type terminals.

Terminal makers are not taking the assault from the microcomputer community lightly. Most have taken advantage of off-the-shelf components to give their products some local intelligence.

"There are really no dumb terminals any more," Johnson said, adding that most terminal makers have discovered that producing an intelligent terminal does not typically cost any more than making a dumb terminal. Consequently, Johnson predicted the the already blurred distinction between terminals and microcomputers will become further confused with low-end microcomputers offering the same basic capabilities as high-end terminals.

Special Report to cover communications nets

Are you lost in a forest of local-area or long-haul networks? Let *Computerworld*'s February Special Report on communications networks update you on network architectures, communications software, independent software and satellite communications.

The Special Report will focus on corporate networking choices, including the feasibility of satellite bypass and private-line networks.

In addition, the report will cover the architectural applications and problems of digital private branch exchanges.

Contributions to the Special Report should take one of two forms: tutorial articles discussing issues or applications stories outlining a particular user firm's experience.

Articles may range in length from four to six typed, double-spaced pages. Artwork, such as charts, graphs and photographs, is also welcome.

Authors should include a brief biography and a telephone number at which they can be reached. The submission deadline for the February Special Report is Dec. 28.

If you have any questions, send them to Janet Fiderio, Special Reports Editor, *Computerworld*, Box 880, 375 Cochituate Road, Framingham 01701.

INSIDE

Daunted by bouts with micros, terminals look for niche/SR/2

Terminals holding their own against micros/SR/3

Multifunction units to expand share of office market/SR/4

Communications network keeps freight firm on track/SR/7

Demand for integrated voice/data tools accelerating/SR/8

Net processor credited with uniting bank's protocols, cutting costs/SR/10

Software lets firm keep track of leases, anticipate bills/SR/14

Purchasing gear need not cause terminal headaches/SR/16

Bargain net helps DP staff get system on-line on time/SR/17

Interim network makes installation a hookup away/SR/17

Expanding ATM networks draw consumers' interest, process 3.4 billion requests a year/SR/18

Migration path from VDTs key in agency's choice of micros/SR/22

Wise terminal makers will heed end-user demands/SR/24

Rise of automated office accompanied by continued debate over possible VDT health hazards/SR/26

POS system keeps bookstore personnel in the know/SR/28

Food lab's work flow monitored by terminals/SR/28

Fiber optics offers prudent alternative to EIA choices/SR/32

Investment in ergonomics can pay healthy dividends/SR/33

Device upkeep maximizes benefits, minimizes costs/SR/34

Scholar praises electronic fellow/SR/36

SPECIAL **REPORT**

Terminals holding their own against micros

Maintaining position in large data-entry, editing environments

By Rene Goldman
Special to CW‡

A great deal of discussion has arisen among users and vendors alike concerning the possible impact of personal computers on the terminal market. Initially, most analysts predicted that the influx of the personal computer would trigger the decline of the terminal market. Embedded in this prediction was the notion that a terminal user would come out ahead by making the swap for the new device providing access to both worlds — terminal emulation and local processing.

After the novelty of the personal computer wore off, evidence of a different sort became apparent. For large, semidedicated data-entry and local editing environments, the terminal was, and is, by far the most cost-effective tool. This is not to imply that personal computers will not capture any of the high-end terminal market. They will, and have, but not to the degree analysts or vendors expected.

The key to the migration of terminals to the microcomputer is largely a function of vertical market applications. Purchasing schemes for terminals and micros in the banking, insurance, medical, utilities or retail world are often dissimiliar in nature. While one industry may be heavily host-application-dependent, another may have a mixture of host application and local processing needs. In environments where local processing outweighs, or is at least equal to, the amount of host-related applications, the microcomputer is a viable alternative.

More users when costs drop

If a terminal is used solely to interact with the host, replacing the terminal with a personal computer is unjustified. When personal computer costs drop to the point where they can compete head-to-head with the high-end terminal market, then more users, not just top executives, will opt to purchase personal computers. This will hold true for a diversified cross-section of industries. But until this time comes, the terminal will remain a viable and needed instrument.

In 1983, International Data Corp., a research firm in Framingham, Mass., determined that 1.78 million CRT-based terminals were shipped in the U.S. marketplace, as compared with 1.5 million in 1982. Overall, the U.S. terminal market experienced an 18% growth in shipments. These numbers, however, do not tell the whole story. To understand the future of the terminal market, a more comprehensive explanation must be made.

The terminal market is made up of asynchronous and synchronous terminals. On the asynchronous side, often referred to as Ascii, there are low-end, limited-editing terminals and full-editing terminals. On the synchronous side, recognized by the Ebcdic character code, there are three segmented areas: IBM 3270-type, IBM former General Systems Division-type and non-IBM synchronous. The final category, clustered processing, is made up of both synchronous and asynchronous terminals (see chart 1).

Price decline an important factor

Perhaps the most important factor in today's terminal market, in terms of how it affects the end user and vendor, is falling prices. In the past, price was directly correlated to the capabilities of the box. Dumb, low-end terminals typically fell at the bottom of the pricing scale, while full-featured, editing terminals occupied the high end.

The pricing structure changed with the advent of offshore production and technological advances. Not long ago, full-editing terminals carried hefty price tags and were luxury products. Today, they are practically a commodity. In 1983, the low-end Ascii market had only a 10% growth in shipments (see chart 2), while the full-editing market had 30% growth (see chart 3).

The decline of the low-end asynchronous market has caused some of the market leaders to rethink their strategies. Digital Equipment Corp., the leader and standard-setter in the dumb-terminal world, responded to declining sales of the low-end Ascii market in 1983 by introducing an enhanced, cheaper ergonomic terminal line, the VT200. Already, the VT200 has received an overwhelming response from the user world and is on the road to becoming the new industry standard for the full-editing Ascii market, succeeding the VT100, for years the de facto asynchronous industry standard.

Intense price competition in 3270 market

Similarly, the 3270 market has had its share of intense price competition, which has eroded the profit margins of these vendors. IBM, who set the precedence in this market, upset the applecart in March when it made replacements to the mainstay 3278 terminals and 3279 color display. The 3178, 3179 and 3180 are departures from the standard 3278 CRT, and all three represent a new subfamily of low-priced terminals.

IBM's combination of price cuts, more features and fast delivery has raised the pressures in the 3270 market, leaving compatibles little room for maneuverability (see chart 4). Plug-compatible vendors have traditionally offered their products at prices 10% to 20% below those of IBM. As IBM turns more of its attention to the office, these vendors have had to trim their profit margins in order to maintain a presence in the 3270 market. This action has made them more vulnerable than ever.

At the close of 1983, sales for the CRT-based terminal market reached $3 billion. Sales for 1984 look as strong as ever. However, this does not mean that the terminal market has easy times ahead. In addition to capturing some of the terminal market share, micros have caused a great deal of anxiety among terminal vendors, which has led to some hasty business decisions, such as Televideo System, Inc.'e unfortunate jump into the personal computer market. Even more disconcerting are the fierce price wars going on between the compatibles, leading to an inevitable shakeout.

Chart 1. In 1983, vendors shipped 1.78 million CRT-based terminals in the U.S. market. Of these, 45% were low- and high-end Ascii terminals; 48% were IBM 3270-type, IBM General Systems Division-type and non-IBM synchronous terminals; and 7% were clustered processing terminals, including both synchronous and asynchronous machines.

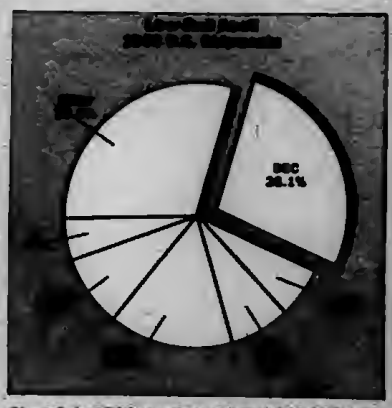


Chart 2. In 1983, vendors shipped 426,850 low- and Ascii terminals, only 10% more than they had the previous year.

Six vendors — Digital Equipment Corp.; Applied Digital Data Systems, Inc. (Adds); IBM; Lear Siegler, Inc.; C. Itoh Electronics, Inc.; and Hewlett-Packard Co. — accounted for 70.6% of those shipments.

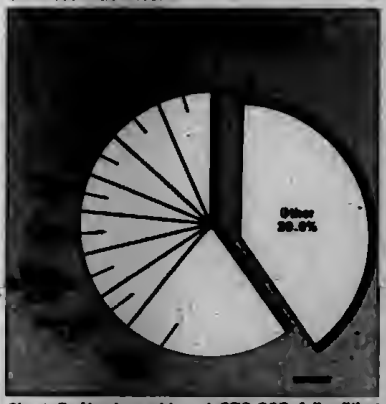


Chart 3. Vendors shipped 379,806 full-editing Ascii terminals in 1983 — a 30% increase over 1982 shipments. Eight vendors — Televideo Systems, Inc.; Hewlett-Packard Co.; Esprit Systems, Inc.; Lear Siegler, Inc.; Liberty Electronics USA; Micro-Term, Inc.; Visual Technology, Inc.; and Wyse Technology, Inc. — accounted for 60.4% of the total shipments.

Chart 4. Shipments of 3270-type terminals in 1983 totaled 531,400 machines. Vendors other than IBM accounted for only 42.6% of that number. These vendors — Telex Computer Products, Inc.; ITT Courier Terminal Systems, Inc.; Raytheon Co.; Lee Data Corp.; Teletype Corp.; and Memorex Corp. — accounted for most of IBM's competition in the marketplace.

Goldman is a research analyst specializing in terminals and workstations for International Data Corp., a research firm based in Framingham, Mass.

In battle for terminal, personal computer market

By Joseph Kelly
Special to CW‡

Since deliveries began in 1971, the IBM 3270 Information Display System has become the most successful terminal family in the data processing world. Industry estimates placed the installed base of 3270 and 3270-compatible terminals at well over two million units by the end of 1983.

Out of this impressive base, approximately one-half are terminals manufactured by IBM; the remainder are divided among the several plug-compatible vendors that have populated the market, including Raytheon Co.'s Data Systems Division, Telex Computer Products, Inc., ITT and Teletype Corp. The stiff market competition between IBM and the independents recently caused a small shakeout, with Raytheon (formerly IBM's No. 1 3270 competitor) and Mohawk Data Sciences Corp.'s MDS Trivex Division leaving the market.

But what of the predictions of doom for the conventional 3270 display terminal that have been heard in some quarters? Will the terminals disappear in much the same way as punch cards? The answer here is probably not. IBM's market strategy in 1983 makes this clear.

Until 1983, the 3270 product line changed slowly. The initial components consisted of the 3277 cluster display; 3275 stand-alone display; 3271 and 3272 cluster controllers; and 3284, 3286 and 3288 printers. The second generation of products, introduced in 1977, included the 3278 cluster display, 3276 control unit/display, 3274 cluster controller and 3287 and 3289 printers. In 1979, a significant addition to the 3270 family came in the form of IBM's first color display, the 3279. Many users view the 3279 as the product that legitimatized the color terminal as a business tool.

IBM shook up the market in 1983 with a rash of new products. These products signaled that IBM meant to protect its market share from two industry pressures: the rising popularity of protocol conversion as an alternative to 3270 terminals and the microcomputer onslaught.

The most significant of the introductions were the 3178 and 3180 Display Stations, the 3279 Color Display Station, the 3270 Personal Computer and 3278 and 3279 Personal Computer attachment features. Other new products included a large-screen gas plasma display (3290), a terminal multiplexer (3299) and new versions of the 3274 control unit. In addition, IBM reduced prices for several of the older generation products as a first step in phasing them out. IBM's actions directly addressed the two most significant threats to its 3270 installed base.

Many users view the 3279 as the product that legitimatized the color terminal as a business tool.

The display terminal market in which IBM competes is divided into two distinct and equally large segments: the 3270 synchronous terminal market and the Ascii asynchronous terminal market.

The Ascii market has been, for the past three years, involved in a low-end price war. Prices for basic smart terminals fell below the $500 level, with high-end prices dropping to $1,500. By contrast, the IBM 3278 Display Station carried a single-quantity price of more than $2,000 at the start of 1983.

The protocol converter was introduced during this time. With the advent of the

Kelly is an associate editor/analyst for Datapro Research Corp., a research firm based in Delran, N.J.

How to be in 16 places

share, IBM 3270 product line positioned to survive

protocol converter, Ascii terminals and printers could change their data formats from asynchronous to synchronous, allowing them to transmit to IBM and IBM-compatible host computers. Although the Ascii terminals did not provide all of the functions found on the 3270 terminals, they were significantly cheaper. In some cases the Ascii/protocol converter combination saved costs by as much as 50%.

IBM countered the price advantage offered by Ascii-to-IBM protocol conversion with the 3178. A compact version of the 3278, the 3178 has a purchase price ranging from $1,660 to $1,720 and provides all of the features found on the older model.

In the long run, the most significant area IBM addressed with its product introductions was that of personal computing. The introduction of the IBM Personal Computer in 1981 affected every segment of the DP industry. One of the areas most affected was the display terminal market. As prices for microcomputers fell, many users replaced display terminals with these machines. The classic intelligent terminal has virtually disappeared. Many industry sources predict the same fate for the general-purpose display. IBM, at least for the time being, has shown that it plans to let the microcomputer coexist with the display terminal.

The first moves in this direction came with the unveiling of the 3278 and 3279 Personal Computer attachment features. These options provided the 3278 and 3279 display stations with personal computing capabilities. The products allowed the 3278 or 3279 display and keyboard to be attached to a Personal Computer processor unit.

IBM's key move, however, came with the introduction of the 3270 Personal Computer. The 3270-PC is a version of the Personal Computer that is intended to be used solely as part of a 3270 cluster. Available in color or monochrome versions, the 3270-PC provides the 3270 user with local processing functions as an integral part of the 3270 system. A key feature of the unit is its windowing capability.

IBM also introduced 3270-PC software. Some view the 3270-PC as one step in IBM's long-range plan to make the Personal Computer the universal workstation of its family of computer systems.

IBM made life difficult

The IBM strategy has made life difficult for its competition. The independent vendors have been forced to scramble to keep up with IBM's new products and lower prices. ITT, Memorex Corp., Telex, Lee Data Corp. and many of the other independents have radically overhauled their product lines in efforts to maintain their shares of the market.

Significantly, each of the vendors has added some personal computing capabilities to its terminal systems. ITT provides for the attachment of the IBM Personal Computer, as well as the ITT Xtra and other IBM Personal Computer-compatible microcomputers. Memorex also supports attachments of the IBM Personal Computer. Telex and Lee Data provide their own intelligent workstations or personal computers; Lee Data also provides a workstation that is compatible with the 3270-PC.

At the same time, profit margins have been reduced as vendors have been forced to lower prices on terminals, controllers and printers to meet the new levels set by IBM. Raytheon's Data Systems Division and Mohawk Data Sciences' MDS Trivex Division folded under these pressures. The shakeout may claim more victims.

As for the predictions of doom, for the time being at least, the replacement of display terminals with microcomputers is not economical. In addition, terminals will probably always be needed for basic data entry applications.

... at once.

With Northern Telecom's unique multi-tasking capability, you can perform a multitude of jobs—simultaneously.

Now your staff can work on spreadsheets, move to word processing, shift to personal computing, then access data and communicate, without missing a beat. No more time-consuming interruptions. Thanks to the unique multi-tasking capability of Northern Telecom's 500 Series Office Information Systems.

With our unique access feature, your staff can leave any application at any point and move to another—and another—while the original task is processed through completion. In fact, the 500 Series will keep track of as many as 16 running programs at once!

Northern Telecom's 500 Series Information Systems also have outstanding communications capabilities. Besides being compatible with each other, they communicate with a multitude of mainframes, including IBM, Burroughs and CDC. They also talk to other minis and even micros such as IBM PC's and Apple.

Our multi-tasking capability allows for up to 16 users to access common files—send or retrieve—from across the hall or across the country. So your people spend less time researching, duplicating efforts and conducting meetings.

Let us show you how easy and cost-effective it is to be in 16 places at once.

Write Northern Telecom Inc., 9705 Data Park, P.O. Box 1222—T-240, Minnetonka, MN 55440; or call 1-800-331-3113. (In Minnesota, call 612-932-8223.)

northern telecom

© Northern Telecom 1984

SPECIAL **REPORT**

Multifunction units to expand share of office market

By George Everhart
Special to CW2

The role of personal computers and multifunction terminals in office information networks will continue to change in the coming years.

Single-function terminals, with their significantly lower prices, have already made an impact on the market. As the technology improves and schemes for improving resource sharing grow, multifunction terminals will take on different roles by tapping the resources within a net.

Industry observers are watching how desktop computers and multifunction terminals coexist today. There is potential in systems that supply both the economy and flexibility of a multifunction terminal with the standalone processing power of a personal computer tied in to a network.

Resource sharing

In applications where data processing needs do not require full-time access to a personal computer, multifunction terminals have proven their worth. They provide resource sharing of personal computer functions, printing, storage and mainframe access.

New technology has given the multifunction terminal more utility. This was done by allowing displays to access different resources on a coaxial local-area network. In some configurations, terminals, when they have access to a multiuser personal computer server, take on the characteristics of a personal computer. Those terminals can also access a cluster controller to communicate with either local or remote hosts.

Although resource sharing is a cost-effective solution for many, it does not solve all problems. At times, users need unshared computing and printing power.

The recent innovation of an interface board that provides a direct channel between an IBM or IBM-compatible personal computer and a local-area network gave personal computer users unshared processing power on their desks while allowing them to share the other resources available online.

Standards must keep pace

As more users accept the combined use of multifunction terminals and multiuser personal computers on a local-area network, industry standards in this area will be forced to keep pace. The IEEE 802 committees have made significant strides in the search for a common industry denominator.

MIS managers, however, cannot afford to wait years for the solutions to their immediate data processing problems. Managers are confused as to the steps they should take to solve their computing needs while the industry decides on its future standards.

As one solution, some manufacturers have offered resource sharing and local-area network technology using current IBM 3270 coaxial cabling and, where they are in place, gateways to standard local-area networks. This lets users share multifunction 3270 terminals, word processors and personal computers while it saves MIS management from having to make a risky investment in new cable configurations.

If the trend toward sharing resources via multifunction terminals and local-area networks continues, personal computers will be installed only where they are truly needed. There is no reason to install one at every desk. Flexible, multifunction terminals can access communications or applications programs for individuals on an as-needed basis. The terminal will play a dual role in the office information network: that of a personal computer and a data entry/retrieval device.

Everhart is marketing vice-president of Braegen Corp., a manufacturer of data communications terminals based in Milpitas, Calif.

Attention IBM Users

"Paradyne Makes Your Remote Devices Behave... Like Locals."

Plug Them Into Paradyne's PIXNET.

With PIXNET, terminals and high-speed peripherals can be placed in any location. In another building or another town.

They'll be gone but not forgotten. Because they'll still behave like local devices, under the control of your same CPU over your same communication lines.

The "Speeder Feeder"

With Paradyne's PIXNET, remote = local. The host CPU will think your remotes are right in the same room. So remote devices can be run from their own locations.

Access any program or application, in any computer on the network, from the remote location.

Low-Cost Network Expansion.

Widen your data operation with this cost-effective networking innovation.

Move a device, a CPU, or a department over the weekend and be up and running Monday morning.

With no extra front-end processors. No extra software, for host or application. No extra burden on the host.

Improved Remote Performance.

Run high-volume IBM 3800 check processors from your home office mainframe. With PIXNET you can process 100,000 documents an hour at your remote site with no additional CPU power.

Print up to 60 pages a minute remotely with Paradyne's Remote High Speed Page Printer. Paradyne's PIXNET also improves the performance of remote high speed printers and IBM 3270s.

Call today and find out how we can put your remote devices on their best behavior.

1-800-482-3333

Paradyne Corporation
P.O. Box 1347 8550 Ulmerton Road
Largo, FL 33540

paradyne

SPECIAL REPORT

Communications network keeps freight firm on track

SAN FRANCISCO — A large international freight forwarder here is using a terminal network as a strategic tool to serve its customers' needs.

At the Harper Group, whose customers include General Electric Co., 3M Corp. and other Fortune 1,000 companies, "data processing is really central to the way the business is run," said Jim Smallman, the firm's MIS director. Smallman reports directly to the firm's president.

The Harper Group maintains an on-line freight inventory system that tracks shipments and paperwork for its clients. Three hundred IBM 3270 terminals and printers in 70 of the firm's U.S. offices communicate over private leased lines with an interactive data base that runs on a 16Mbyte IBM 4341 at Harper Group headquarters here.

Nine of the firm's major clients have terminals in their own offices connected over leased lines to the freight inventory system; others tie in to the network through dial-up links. Smaller clients rely on the shipper's branch offices to provide them with information from the inventory system.

'Data processing is really central to the way the business is run.'
— Jim Smallman, MIS director, the Harper Group

Clients can reserve space for shipments on planes or ships and can confirm their reservations immediately through phone calls to Harper Group branch offices that are on-line with the freight inventory system. Customers with their own terminals can prepare and revise waybills for the shipments and transmit them for printing to a Harper Group branch or can have waybills that have been prepared by the Harper Group transmitted to them for printing.

The data base enables the firm to provide its larger customers with analyses of shipping routes and orders to help them identify profitable routes and monitor expenses. Additionally, clients who convince their suppliers to book shipments through the Harper Group can use the IBM 3276 terminals or call a local branch office to get information from the data base about shipment schedules, delivery problems and projected costs.

The data base and terminal network give the Harper Group an edge over its competitors. "Everybody in the industry gets the goods from A to B," Smallman explained, but most U.S. shipping firms rely on manual record-keeping systems and cannot provide their clients with as detailed information as they desire.

"There's a lot of pressure to improve the efficiency of our industry," he said.

One of the reasons for the pressure is that large manufacturers — a group that provides the Harper Group with much of its business — are cutting costs by relying on tight order management rather than high inventory levels to keep their plants stocked with necessary manufacturing components. In turn, shippers must provide highly reliable information about delivery dates for goods, Smallman said. "We have systems designed to do that."

Another reason is that customers have begun to buy parts from vendors who provide them at competitive prices, no matter where the vendors are located, rather than purchasing from one supplier in the U.S. The trend requires freight forwarders to provide information to help their clients track shipments.

"If the customer has a problem with an order, he can't just call the local supplier and have it trucked over," Smallman said. "When you're dealing with Hong Kong, Germany and Korea, it's a much more sophisticated, complex control problem."

Fluctuating international exchange rates have also increased the complexity of the services shippers must provide. Increasingly, he said, Harper Group's customers are determining where they trade on the basis of the changing values of international currencies. As these values fluctuate, customers' trade patterns change, requiring more flexible, responsive service on the part of shippers.

"It all boils down to having good data systems," Smallman said. "The future of this business depends on integrated data networks with widespread international coverage."

Harper Group has used the freight inventory system in its domestic offices for about five years. It designed the system with the intention of expanding it internationally as soon as the technology to do so became available. Smallman said the firm wanted to use the 3270 terminals in an international network, but could not justify the cost of private leased data lines for its overseas offices.

The firm considered using a value-added network connected with an asynchronous protocol, but rejected that option because such a network — running over public telephone lines — lacked the high-speed error-checking capabilities Harper Group

See FREIGHT SR/10

WHAT THEY CALL A PORTABLE, WE CALL A LOAD.

Today, almost everyone claims to have a portable computer. The problem is, almost no one does. Most portables have a separate data storage device, separate printer, separate modem, and some even require a separate monitor or bulky battery pack that can make them a liability on the road.

The Sharp PC-5000, on the other hand, is a true portable. It's a compact 16 bit, 128K microprocessor (expandable to 320K) with 192K of ROM, an 80 character display screen, removable bubble memory storage, built-in rechargeable power source and bundled software. It's also available with options like an integrated modem that lets you connect with your mainframe and an integrated correspondence-quality printer which doesn't increase the size of the system. And even with all these features, the PC-5000 fits neatly into a briefcase and weighs under 14 pounds. Almost 25% less than its nearest major competitor. At a price that's lighter, too.

Of course, there's one thing about the PC-5000 that isn't small. Its working capacity. It functions as a desktop computer. And is compatible with a wide variety of MS-DOS* software.

So if you need a truly portable computer, look into the Sharp PC-5000. The one that may be the smallest, lightest—and the best value for the money. In short, a computer that will lighten your work load. Not add to it.

For more information call 1-800-BE-SHARP or fill in the coupon.

MS-DOS* is a registered trademark of Microsoft Corporation.

SHARP

FROM SHARP MINDS COME SHARP PRODUCTS

Sharp Electronic Corp. DEPT-SYS-CW-11-26-4
Computer Systems Division
1900 E. Carroll, Peoria, IL 61614
☐ Please send me more information about Sharp's PC-5000.
☐ Please set up a demonstration.
Name_____
Title_____
Company_____
Street_____
City_____ State_____ Zip_____
Phone ( )_____

A/V EQUIPMENT, AUDIO, BANKING SYSTEMS, CALCULATORS, CASH REGISTERS, COMPUTERS, COPIERS, ELECTRONIC TYPEWRITERS, FACSIMILE EQUIPMENT, MICROWAVE OVENS, PROFESSIONAL VIDEO CAMERAS & MONITORS, TELEVISIONS, VIDEO TAPE RECORDERS.

Demand for integrated voice/data tools accelerating

By Sandy W. R. Moore
Special to CW‡

Technology's challenge is to get more functionality into the integrated voice/data terminal's compact package design.

Whether or not a market exists for integrated voice/data terminals is no longer questioned. In the past three years, users have not only accepted the idea of the integrated voice/data terminal, but they are also finding new applications and better software for their use. And what's more important, manufacturers are listening to them.

In early 1984, a number of players, including Rolm Corp., Zaisan, Inc. and Televideo Systems, Inc., announced they were entering what they saw as a high-potential market, while others like IBM, Data General Corp. and Digital Equipment Corp. began making noise about their future participation. With so many players entering the field, it is clear that the market will continue to expand.

The early integrated voice/data terminal market was unstructured and lacked direction. The first integrated voice/data terminal, introduced in 1982, was targeted at the corporate executive.

The principal parties in the early integrated terminal market, Northern Telecom, Inc. and GTE Telenet Communications Corp. were producing voice-oriented devices engineered by voice designers. When the market expanded to include MIS managers and business professionals, manufacturers found themselves trying to sell a voice-oriented integrated voice/data terminal to a DP person. The unit did not meet his needs, so the integrated voice/data terminal market shifted to meet new demands.

Early 1984 was a watershed for both integrated voice/data terminal marketing and technology. Technologically, the emphasis shifted from voice to data. These new terminals had increased access to computer systems and current personal computer-compatible systems that can share fields, software and data simultaneously.

From an applications standpoint, the integrated terminal was no longer strictly targeted toward the corporate executive. It emerged as a tool for anyone looking for ways to improve office productivity.

The integrated voice/data terminal market will continue to expand as more applications are developed. Office workers are finding the voice/data terminal an efficient device. Already, the banking industry is a big voice/data terminal user. At Citibank, for example, employees use these terminals with an 81-number directory to call up key customers or data bases. While talking to the customer, they can scroll necessary data onto the screen.

Doctors use voice/data terminals to access medical data bases for information on new drugs and drug incompatibility, while lawyers use them to tap law data bases for research or recent court decisions. The trucking industry, too, is finding these terminals useful, relying on combined voice and data devices to keep track of pickup, delivery and general disposition of loads.

New uses will progress logically to accounts receivable, purchasing and expediting functions. When a seller, using a voice/data terminal, can scroll up who owes money, automatically dial and then talk to the person, efficiency is increased.

Or, consider the telemarketing industry. With a voice/data terminal, the seller can call up information on a particular client, telephone that client and say, "Our records show you last ordered this product and that data. Do you need to reorder?" The possibilities are endless.

The market will also expand as users begin to appreciate the differences between the voice/data terminal and the personal computer. Voice/data terminals cost less than a personal computer, and while most micros are single-station units, through hardware and software combinations a single IBM Personal Computer can become a multiuser system. In addition, the voice/data terminal offers an element of security control in the office that is sometimes lost through personal computer usage.

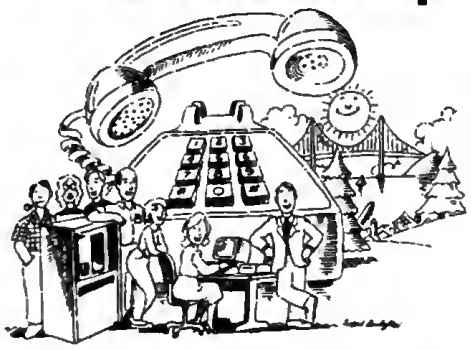
As the integrated voice/data terminal market expands, user preferences will occur. Currently, standalone voice/data terminals — those that can be used with key systems, private branch exchanges (PBX) and central office lines — have a market edge. But in the near future, perhaps the 1985-86 period, proprietary voice/data terminals, those that op-

See VOICE SR/11

Moore is vice-president, terminals, for Northern Telecom, Inc., a maker of integrated voice/data terminals.

Lotus™ on a VAX? Yes. 415-841-9594
PL/M™ on a PDP-11™? Yes. 415-841-9594
CP/M™ on an MV-8000™? Yes. 415-841-9594
WordStar® on a VAX®? Yes. 415-841-9594
SuperCalc® on an Eclipse®? Yes. 415-841-9594
MS-DOS® on a VAX? Yes. 415-841-9594
dBASE II® on a VAX? Yes. 415-841-9594

Micro Software on Minicomputers?



Yes. 415-841-9594

We can put your VAX, PDP-11, HP-3000, Eclipse or Nova™ to work running more software at more terminals than anyone.

We do it with The BRIDGE™, software coupled with an add-on board. The BRIDGE makes all terminals work like virtual microcomputers.

You can run all the popular micro software while keeping all the advantages of your minicomputer (enhanced speed, shared data, increased storage, etc.).

The BRIDGE co-processor technology expands your system in an orderly way, without overloading the host. It's a lot better than buying a bunch of microcomputers and trying to tie them together. (It's also a lot cheaper.)

Virtual Microsystems is a crack outfit of hardware designers, software writers, systems consultants, and helpful support people located in Berkeley, California.

We even have a salesman.

Call today. Ask for Dan.

microsystems

"The BRIDGE People"
2150 Shattuck Avenue, Suite 300, Berkeley, CA 94704

Trademarks: The BRIDGE — Virtual Microsystems; Lotus — Lotus Development Corporation; PL/M — Intel Corporation; dBase II — Ashton Tate; VAX, PDP 11 — Digital Equipment Corporation; Eclipse, Nova, MV-8000 — Data General; HP 3000 — Hewlett Packard. Registered Trademarks: CP/M — Digital Research, Inc., WordStar — Micropro; SuperCalc — Sorcim; MS-DOS — Microsoft Corporation.

GLOBAL SLACK

DAVIDSON

Net processor credited with uniting bank's protocols,

JACKSONVILLE, Fla. — Until recently, the commitment a bank here made to use specific terminal equipment — regardless of its communications protocol — saddled the bank with an abundance of leased telephone lines and an overabundance of monthly bills.

Atlantic National Bank of Florida, a statewide institution with 110 branch offices and $3.4 billion in total assets, purchased terminals from different vendors to suit its varied needs. "We like to buy the best terminal to fit the job," according to W. J. Cole, Atlantic's vice-president for operations.

'We like to buy the best terminal to fit the job.'

— W. J. Cole, vice-president of operations, Atlantic National Bank of Florida

The bank used three types of terminals, which operated under three different communications protocols and utilized different transmission speeds:

- TRW Corp. Teller Assist terminals, which allowed tellers to mark up checks and perform inquiries about customer balances. Atlantic's branch banks operated about 1,100 Teller Assist machines. The machines communicated asynchronously at a rate of 1,200 bit/sec.
- IBM 3270-type CRT terminals from Memorex Corp., Harris Corp. and other vendors. The branch banks operated about 350 CRTs, which communicated using IBM's 3270 bisynchronous protocol at 2,400 bit/sec.
- Diebold, Inc. 910 and 911 automatic teller machines (ATM). Atlantic's branch banks had a total of 180 ATMs, which used bisynchronous protocols to communicate at either 2,400 or 4,800 bit/sec, depending on volume.

"Because of the different protocols and different line speeds, we run three leased lines from each of our branches," Cole said. Atlantic spent about $100,000 per month on leased telephone lines over which branch banks communicated with headquarters.

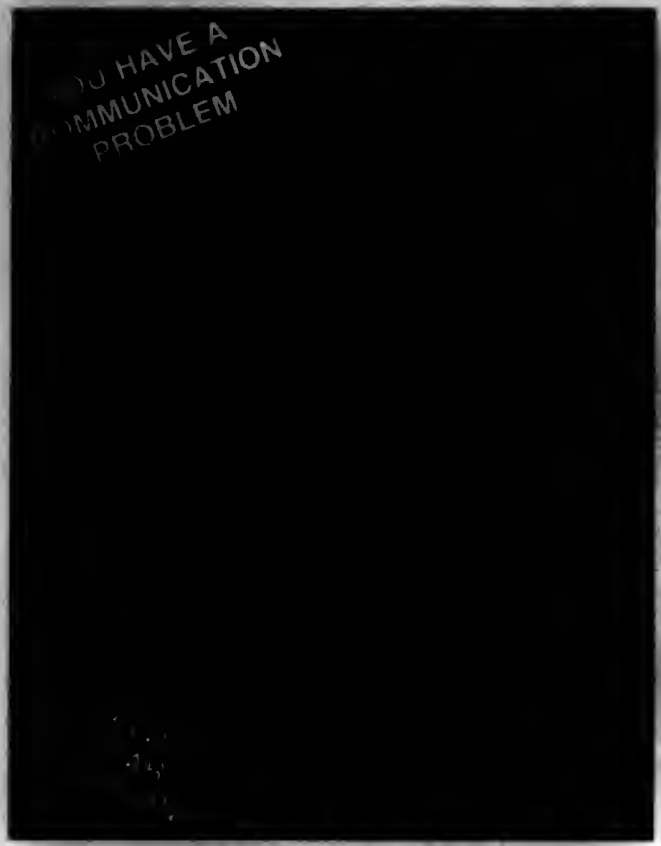
Last year the bank helped Datamaxx USA Corp. develop a host-independent network processor to solve the problem of different protocols. The Communications Management Device (Command) takes inputs from a variety of devices and outputs a signal that Atlantic's front-end processor and host read as IBM 3270 bisynchronous protocol. Atlantic finished installing Command in its branch banks in August.

Cole said use of the units allowed the bank to cut the number of leased telephone lines running from each bank branch from three to one, without changing the terminal configurations at its branches. Atlantic now saves 30% to 40% — between $36,000 and $40,000 per month — in leased-line charges, according to Cole.

Data from the Teller Assist, CRT and ATM terminals at Atlantic's branch banks goes through the Command unit and is transmitted 9,600 bit/sec over a leased line to one of Atlantic's 16 Tandem Computers, Inc. Nonstop II front-end processor nodes.

The nodes, located at one of four regional communications centers, feed the communicated data to the bank's mainframe, a 16M-byte National Advanced Systems, Inc. AS/9050, at its headquarters here.

Besides allowing Atlantic to save



FULL COMMUNICATION CAPABILITIES IN LIMITED DISTANCE APPLICATIONS

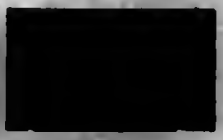
For all your networking needs — DATA-VOICE-VIDEO — the clear choice is Fibronics fiberoptic communications, for providing fast, effective solutions. Fibronics is a full-capability manufacturer of complete fiberoptic systems including fiber, cable, optical components, modems, and multiplexers for all limited distance communications application.

If you're in the dark concerning any limited distance application, contact Fibronics. We will have a good understanding of your problem and, more than likely, a clear solution ready and waiting.

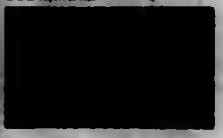
CALL TODAY: (617) 778-0700

Fibronics International Inc.
325 Stevens Street Hyannis, Massachusetts 02601

Cable Benefit Unibus 600 and PASCII are trademarks of Fibronics International Inc.
IBM is a registered trademark of the International Business Machines Corporation.
ITT Courier is a registered trademark of the International Telephone and Telegraph Corporation.
TELEX is a registered trademark of the TELEX Corporation.
Memorex is a registered trademark of the Memorex Corporation.
Raytheon is a registered trademark of the Raytheon Company.



FM-600 VOICE & DATA
The UNIMUX 602™ is used either to transfer bulk quantities of voice and data in large data centers or for high density node applications. The UNIMUX carries up to 128 data and/or voice circuits including IBM 3270, RS-232, v. 35, analog voice, TTL and more. It can be used in DCE to DTE or DCE to DCE networks.



FM-1600 HIGH SPEED DATA
The FM-1600 Cable Benefit™ Series multiplexer systems can reduce your cable (fiberoptic or coax) requirements 32 to 1. The Cable Benefit can connect two similar or different controllers within one system and is compatible with IBM 3270, ITT Courier, Telex, Memorex, Raytheon and others.

FOV-4000 CAD/CAM
The FOV-4000 Series fiberoptic links extend the distance up to 3 km between the CPU and CAD/CAM workstations. High resolution monochrome or color transmission is accomplished with multiplexed data.

FM-600 UNIBUS EXTENDER
The FM-600 Series permits the extension of a DEC UNIBUS up to 3 km from a VAX or PDP-11 computer. This fiberoptic bus extender can transmit full duplex data for high speed line printers, monitors and color graphics display generators.

FC-3000 PASCII™ PROTOCOL CONVERTER
The PASCII™ protocol converter allows IBM 3274 controllers to communicate with asynchronous ASCII terminals/printers without requiring a front end controller (i.e. 3705).

OPTRONICS
Fibronics offers a wide variety of fiberoptic cables, standard and specialty, for use in indoor/outdoor, direct burial, military and plenum applications with complete

FREIGHT from SR/7

wanted, Smallman said. "You've got to have fully error-checked protocols when you're moving the kind of financial and technical data we are."

He said the firm chose to wait for a more reliable means of connecting its international offices to its information network.

Immediate purchase

This year, Computer Sciences Corp. began offering a value-added network with an error-checking high-speed bisynchronous protocol and virtual circuits. "When that became available, we got it immediately," Smallman said.

The Harper Group will bring offices in London, Hong Kong and Sidney, Australia, on-line this month over the value-added net. Branch offices in Japan, South Africa and Germany are scheduled to go on-line by March.

According to Smallman, in the future, the company may install dedicated leased lines in some foreign offices if business volumes increase enough to justify the expense of the lines.

With the foreign Harper Group offices' current volume, dedicated lines would cost about five times as much as the value-added network, Smallman said.

cutting costs

money, the processor also gives the bank more options when it looks to buy new equipment. Before it installed the Command units, Atlantic required new equipment to have a protocol that matched one of the three already in use, Cole said. "Now we don't have to worry about that anymore."

The Command unit allows data that communicates over standard communications systems to be transmitted over the single phone line that runs out of each branch bank, so restrictions on new equipment are minimal, Cole said.

Each command unit includes a CRT terminal from which analysts can run diagnostics on the system. The terminal also provides on-line access to information in Atlantic's mainframe. Cole said this feature allows small branch banks that could not justify the cost of a CRT terminal for on-line use to purchase a terminal that allows both access and communications savings.

Each Command unit costs Atlantic $6,000, including the CRT terminal. Atlantic receives a discount from Datamaxx because it helped develop the unit and it buys in volume. Per-unit prices for the unit range from $6,000 to $8,200, depending on configuration and number purchased.

Atlantic has equipped all of its bank branches with Command units and has installed 120 of the network processors.

The bank keeps about 10 spare units in storage in case operating units break down in the field. Cole said the bank saves time by installing the spare units, rather than waiting for repairs. When a faulty unit has been replaced with a working one, Datamaxx repairs the broken machine, and Atlantic puts the repaired unit in storage to serve as a replacement machine later.

VOICE from SR/8

erate, for example, with a Rolm or a Northern Telecom PBX, will see a greater market edge. This will be partly because of the potential for messaging systems.

By 1987, the market will likely shift back to stand-alones, provided the technology does not slow down and integrated voice/data terminal prices decrease. By then, manufacturers will be able to put more processing power and other features into a smaller space and reduce heat and ventilation problems. Technology's challenge is to get more functionality into the integrated terminal's compact package design.

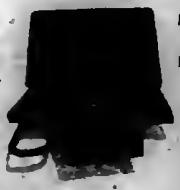
The marketing challenge for the future will be to find new integrated voice/data terminal applications. Those industries that deal with renewals, such as insurance, and the general consumer market can benefit from integrated terminal applications. The market has proved that users will pay over $1,000 for these terminals. Manufacturers must lower that figure for users who will want to use electronic mail systems and to tap into a wealth of data bases.

In its short history the integrated voice/data terminal has come a long way. One point does seem certain: The integrated voice/data terminal is here to stay.

Can you picture a local voice/data network that is powerful, practical and priced right ...even for very small groups of users? It's real. And we've installed more than 40,000 ekinsmix.

That's right. At Tellone, we've been showing companies large and small how to manage growing voice and data networks for years, and "cost-effective" is our middle name. Right now, for example, our Data Carrier Systems are helping more than 500 companies extend the useful lives of their telephone systems by letting them double as local data networks. For as little as $450 per channel, DCS enables users to route synchronous/asynchronous data, at up to 9600 bps, to virtually any existing telephone jack. This makes adding or moving a terminal as easy as plugging in a phone—no modems, no cable, and no disruption of voice traffic at any time. We also offer a full line of high-performance multiplexers and other networking products, but most of all we provide expertise. When you do business with Tellone, you deal with our own applications experts—people who know networking inside out, and share your concern about controlling costs. If this sounds like a good idea to you, let's talk. We have offices nationwide, and we'd welcome a chance to communicate with you.

"Pulse Dialing" on the PBX Line



Simultaneous Voice and Data Transmission

TELLONE

For the number of the office nearest you call 1-800-227-3800, Ext. 122. Or write Tellone Corporation, PO Box 607, Kirkland, WA 98083. In Canada write Tellone Ltd., 100 Amber St., Markham, Ontario L3R 3P4.

The SAS System. . .

The Solution
Your Information Center

☐ I want to learn more. Send me The SAS Solution packet.
☐ Have a sales representative call me today!

Please complete this coupon or attach your business card.

Name _____
Title _____
Company _____
Address _____
City _____ State _____ ZIP _____
Phone (_____) _____
Hardware _____
Operating System _____

SAS Institute Inc.
SAS Circle, Box 8000, Cary, NC 27511-8000

SAS.

Software lets firm keep track of leases, anticipate bills

NEWPORT BEACH, Calif. — When an equipment upgrade forced the data center of an insurance firm here to take a hard look at its equipment accounting practices, it found them lacking.

"We really had no idea how much book value was left on certain items, which items were purchased and which were leased, where we stood on investment tax credits and what the various components of the data center were really costing us per month to operate," said George Beveridge, an independent consultant on retainer for Pacific Mutual Life Insurance Co.

During its equipment upgrade in 1982, Pacific Mutual brought in a 24M-byte IBM 3081 to replace two National Advanced Systems, Inc. machines. It has since added peripheral components, and the firm's data center now includes about 400 Lee Data Corp. terminals, including 1216s, 1220s and 1230s; seven IBM 3287 and 3289 terminals; and other equipment.

PACIFIC MUTUAL

The 400 Lee Data terminals, with their associated controllers and keyboards, represent at least 900 discrete components.

The firm realized it would have to change its accounting practices to keep track of financial information for all these components.

Beveridge said few item-by-item records had been kept on equipment in the old configuration after it had been acquired. Record keeping had been turned over to accounting, which handled it according to corporate financial needs.

On the books, components were grouped in categories that were too general for the data center's accounting needs.

He began looking for a network management software package that would allow Pacific Mutual to manage finances for the equipment in the new system. He decided on Netman from California Software, Inc. because it offered the financial capabilities the data center needed and features for tracking components. Pacific Mutual installed Netman in early 1983, shortly after installation of the new hardware.

The software package tracks information such as vendor, terms of the contract for lease or purchase, maintenance contract details, date of order, delivery and installation.

Pacific Mutual leases its Lee Data terminals from a third-party lessor and has been ordering about 25 new terminals each month.

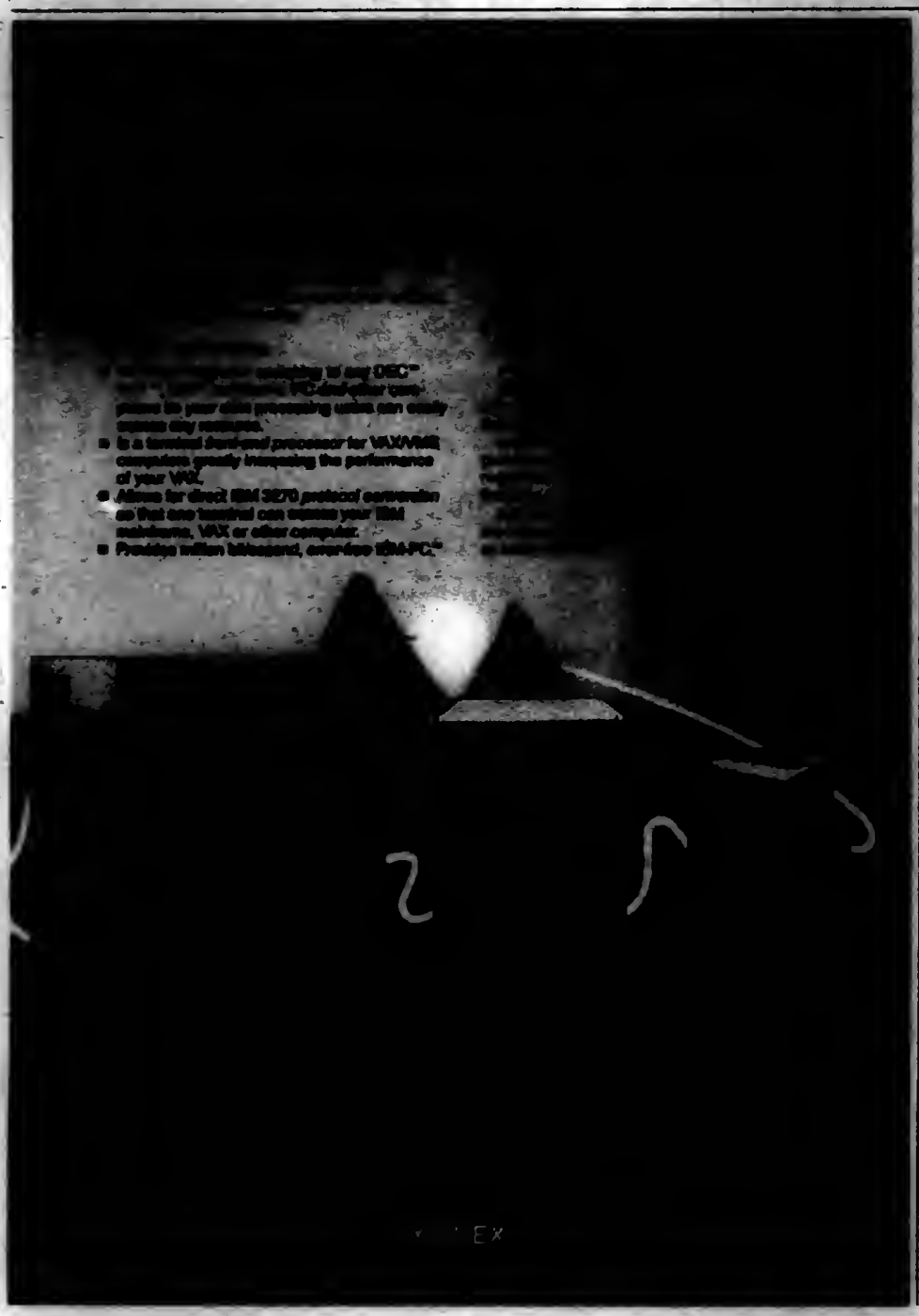
Because the firm enters data on new leases when it orders equipment, rather than when it installs them, it can anticipate what lease invoices it will receive in any given month, Beveridge said. When invoices arrive, the data center staff checks them against expectations and notes any discrepancies.

Keeps track of money

Beveridge said this capability is important for Pacific Mutual because it has leases on hundreds of terminals and controllers. If the firm loses track of the money it has agreed to pay for this equipment, it cannot check whether its vendors are billing it according to contract specifications, Beveridge said.

For the IBM terminals, Pacific Mutual uses the package to monitor its credit accruals toward purchase. Beveridge said that credits maximize at 50% of the purchase price. Netman's monthly reports list where the IBM accruals stand, and when they approach 50%, the firm decides whether to purchase the terminals. If the terminals will be in use for a while, purchasing generally makes economic sense, he said.

Pacific Mutual also relies on the package to keep track of contract expiration dates, investment tax credits on its terminal leases and internal chargeback to user departments.



More
For Less

Hewlett-Packard introduces the HP 2392A.

When you get this new HP display terminal, suddenly you'll be running applications

with less effort. In less space. For less money. And with more confidence, having HP's reliability and quality to count on.

Less effort.

The first thing that will impress you is how easily everything fits into place. Integral tilt and swivel make screen and keyboard adjustments easier. Power and brightness controls are right up front, at your fingertips.

Working becomes more pleasant, thanks to the non-glare, high-resolution [illegible] will display [illegible] scroll [illegible] to [illegible] be stored [illegible] working with [illegible]

More helpful.

With eight non-volatile, programmable function keys, it will take you less time to enter complex or repetitive commands. A handy terminal status line tells you what mode you're working in. And 17 national language keyboards are available to make work easier for everybody, just about everywhere.

You get more speed, too. You'll communicate with your computer at up to 19,200 bps in block, line or character mode. So your information will get around in less time. It's also easy for you to get hard copy, since our terminal has an optional printer port you can install yourself.

If you're an ANSI user, you've also got [illegible] for [illegible]

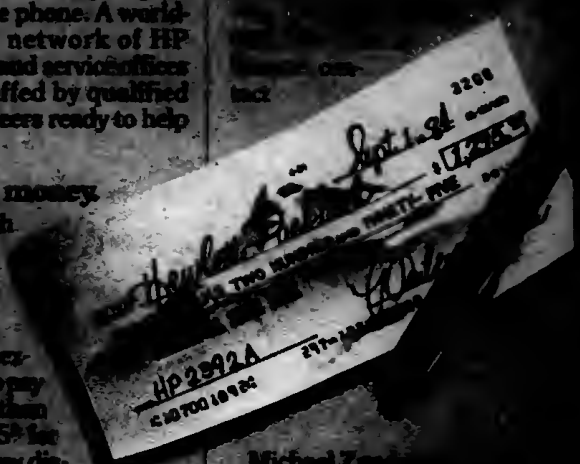
technology to minimize component count and increase reliability.

But, if you do need support services, just pick up the phone. A worldwide network of HP sales and service offices is staffed by qualified engineers ready to help you.

Less money.

With all these features, you'd expect to pay more than $1,295* for our new display terminal. But that's all we're asking. So why settle for less?

To get more information, call your local HP sales office listed in the white pages. [illegible] thank you.



Michael Z[illegible]
Hewlett-P[illegible]
[illegible]
[illegible]
The [illegible]

SPECIAL **REPORT**

Purchasing gear need not cause terminal headaches

By Jack R. Rule
Special to CW‡

Determining a company's data processing needs was once the domain of the MIS or central DP department. This is not so today. Today, managers at the local departmental level are often faced with the task of selecting the hardware and software that will meet their departmental needs.

How does a manager with little experience in purchasing hardware and software, in this case terminals, cope with the myriad systems choices that are currently on the market? One key fact to remember is that five types of terminals will be needed for the office of today and tomorrow:

Tomorrow's workplace will require office machines that communicate easily with each other and that are compatible with any data base.

- Dumb terminals.
- Word processors with access to personal computers.
- Terminals with graphics capability.
- Terminals that combine the previous three categories.
- Computer-aided design and manufacturing systems that can interact with all the above categories.

There is a rationale behind this selection of terminals: It does not make sense to put expensive data terminal equipment, such as a personal computer, on every desk. If the application calls for a dumb terminal (for inventory control, for example) or a dumb terminal with a personal computer attachment (for a manufacturing application), then these terminals should be used.

Tomorrow's workplace will require office machines that communicate easily with each other and that are compatible with any data base. Departments will be custom-tailored by managers using a combination of equipment and software resources. Furthermore, staff will be able to communicate data, voice and video pictures from their individual terminal workstations. Equipment will be easily expandable.

Presently, terminals are available that go a long way in this direction. Some current models are capable of accessing many sources of information, including multiple mainframes. To manage data flow, local-area networks have been developed that use gateways to allow terminals to access data base sources. Local-area networks are now available that allow up to 500 data processing devices, including those manufactured by different vendors, to communicate with each other. Trends are moving toward fully integrated and expandable offices that let users access information from any office.

Today's local department manager has more responsibility and has assumed an important role in office automation. The manager's decisions can make a vital difference in company productivity and market share.

Local managers assumed the responsibility for equipping their offices slowly as DP became less localized and the demand for full OA increased. Also, as software packages emerged that made applications development by the nontechnical user possible, it became clear that the department that was going to be using the application software should have the final decision over its purchase — not the MIS manager.

It should come as no surprise, however, that some department managers accepted these duties with discomfort. Many had relatively little experience with the sophisticated technology.

In the early days of the first mainframes, the task of managing a company's automated resources resided in the hands of an army of central DP gurus, about whom the rest of the company knew little. At that time, DP configurations were fairly inflexible. The mainframe performed maintenance and updates on data as well as the heavy-duty processing.

In those days, most terminals were dumb, asynchronous types, which could only accept information and perform light analysis functions. Productivity boosters that we take for granted today like real-time, on-line processing and multitasking were unknown. The mainframe was used to process scheduled jobs consisting of large amounts of raw data. End users typically received the processed results of their work at month's end.

Defining and implementing application programs and finding the hardware that could run these programs, as well as planning the allocation of resources for the future, was

See GIAR SR/19

Rule is a senior product manager for Racal-Milgo, Inc., a manufacturer of data communications terminals based in Sunrise, Fla.

Lear Siegler
Proven Quality and Reliability.
Now More Versatile Than Ever.

Now your best buy in general purpose video display terminals is even better.

Lear Siegler's popular ADM 11 conversational and ADM 12 block mode terminals are available with more design flexibility and system compatibility.

In addition to standard compatibility with Lear Siegler terminals, you can now get compatibility with ADDS Viewpoint and Regent 25, Hazeltine 1400, 1420 and 1500, DEC VT52, and TeleVideo 912/920, 925 and 950.

You can enjoy Lear Siegler's superior performance and reliability, ergonomic design and High Touch™ style in more applications than ever before.

Call your local distributor or contact us directly for complete information on the ADM 11 and ADM 12 video display terminals.

LEAR SIEGLER, INC.
DATA PRODUCTS DIVISION
901 E. Ball Road, Anaheim, CA 92805
(714) 778-3500

© 1984 Lear Siegler, Inc. Viewpoint and Regent are registered Trademarks of Applied Digital Data Systems, Inc. VT52 is a registered Trademark of Digital Equipment Corporation.

SPECIAL **REPORT**

Bargain net helps DP staff get system on-line on time

By Raymond Bugg
Special to CW2

ARDSLEY, N.Y. — Starting from scratch, the data processing shop at a division of Ciba-Geigy Corp. acquired terminals and a communications network for a newly acquired plant in Delaware and brought them on-line with the corporate data center here within about three weeks, in time to transmit data on its first day of operation under its new owner.

The data processing shop, the information systems department of Ciba-Geigy's Plastics and Additives Division, managed the speedy setup even though the equipment it had deemed necessary for a communications link between the plant and the firm's data center arrived a month and a half after the acquisition took place.

The solution that allowed the information systems department to accomplish its task was an interim communications network that cost the firm only $3,000, plus communications line costs.

The Plastics and Additives Division of Ciba-Geigy develops a range of specialized industrial products, such as chemical and light stabilizers. Its information systems department consists of a small staff of consultants, which elicits assistance for specific projects from Ciba-Geigy's corporate data processing shop, the management services department.

Ciba-Geigy's corporate data center here, located approximately 10 miles from the division's headquarters in Hawthorne, N.Y., maintains a 12M-byte IBM 3033 that the division accesses through remote job entry and a 24M-byte IBM 3081 Model K that it accesses via an on-line, real-time 3270 network. The mainframes provide CICS, TSO and IMS facilities.

On Dec. 15, 1983, the information systems department learned that Ciba-Geigy Plastics and Additives was contemplating a business acquisition. Ciba-Geigy's corporate management had signed a letter of intent to acquire a portion of the E. I. DuPont De Nemours & Co. organic pigments business.

The acquisition was to include the Delaware plant, which would continue its role as the primary source of product production. The final agreement date was to be sometime during the first quarter of 1984.

The acquisition was to include only one piece of the plant's hardware — a Hewlett-Packard Co. HP 3000 — and no operational systems for inventory management and other critical applications. The plant had operated a manual inventory and pricing system, and its staff was unfamiliar with on-line technology.

Yet the division needed applications to be up and running on the first day of postacquisition operation to minimize any disruption in customer services and production processes and to maintain data as accurately as possible on the new product line.

Once the acquisition was imminent, the management services department developed the definition and scope of the project to link the plant with Ciba-Geigy's data center and assembled an acquisition team. The project team consisted of members from several of Ciba-Geigy's corporate MIS departments who took responsibility for application development, hardware procurement and installation.

An analysis by the team determined that the newly acquired business should, whenever possible, be incorporated within divisional and corporate systems. In line with this plan, the team decided to reconfigure the HP 3000 to provide a remote job entry link to the data center's 3033 and to install a leased-line 3270 network to provide access to CICS and the Plastics and Additives Division's order entry and inventory system, which ran on the company's 3081.

For accessing the 3081, the team chose a network consisting of IBM 3270 equipment — one 3276 display controller and four 3278 CRT terminals — which would access the division's host processor via leased, private data lines.

In February, a final acquisition date of April 12 began to surface, and the team placed orders for the hardware and communications lines.

But Ciba-Geigy's Telecommunications Group, which held responsibility for equipment acquisition, pointed out to the project team that the targeted installation dates for the ordered hardware and data lines were in jeopardy: The projected ship dates for the IBM equipment fell more than a month after the acquisition date, and the AT&T divestiture caused delays in the installation of the data lines.

With the assistance of the Telecommunications Group, the project team established criteria for a viable setup the division could use until equipment and lines for its permanent system arrived and could be installed. The following were the criteria for the interim setup:

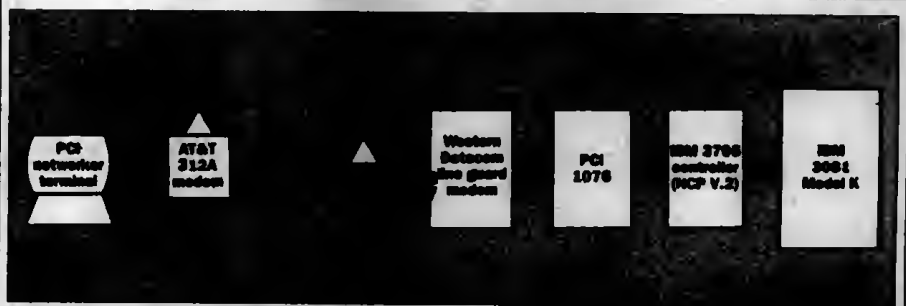
- It should be a 3270 look-alike to reduce the need for redundant training once the permanent environment was in place.
- It should consist of easily installed, off-the-shelf equipment because of the time frame.
- It should also be as inexpensive as possible because the effort would represent a short-term solution.

With these criteria in mind, the Telecommunications Group recommended the use of a dial-up terminal that would allow 3270 emulation.

The corporate data center had a Protocol Computers, Inc. (PCI) 1076 protocol converter resident on its 3081 mainframe, and the Telecommunications Group advised the project team to use an associated terminal, the PCI Networker Terminal, as the dial-up 3270 look-alike.

The Telecommunications Group ordered all the required equipment and received it within a matter of days. The interim configuration consisted of:

- Two PCI Networker Terminals, chosen because of their resemblance to the 3270s the firm had on order.
- Two Penril Corp. 212A 1,200 bit/sec modems, chosen because they were available immediately.
- Two direct nondata business telephone lines. Ciba-Geigy chose the nondata lines because they could be installed within 10 days after they had been ordered. The 9,600 bit/sec data lines the firm had ordered for its permanent configuration required a 100-day waiting period from order to installation.



The telephone communications system linked Ciba-Geigy Corp.'s plant to its data processing center through a series of steps designed to maintain security. A user at the Delaware plant initiated a voice telephone call to the data center via one of two direct business lines attached to the Protocol Computers, Inc. (PCI) Networker Terminals. A Western Telecom Co. Line Guard modem at the data center received the call and issued a password request to the user, who entered his password on the terminal. If the password was accepted, it caused a line disconnect and initiated a callback to the user's predefined business line. When the callback was completed, the Line Guard modem passed control to the PCI 1076 protocol converter, hooked to the data center's IBM 3081 Model K through an IBM 3705 controller running IBM's Network Control Program Version 2. The protocol converter allowed IBM 3270 emulation, giving the user access to applications that resided on the host.

Within three weeks of the decision on the interim processing setup and about a week before the acquisition date, the configuration was up and running. The interim configuration resulted in a totally functional off-site operation that met the targeted acquisition date.

On April 12, the plant's first day of operation under Ciba-Geigy management, the facility sent data on inventory levels to the division's mainframes.

By June, the permanent leased data lines had been set up and the IBM terminals installed. The information systems department replaced the interim network with the permanent one.

The PCI Networker Terminals are now being used by some of Ciba-Geigy's technical employees as home terminals that tie in to the corporate mainframes.

Ciba-Geigy' Plastics and Additives Division plans to include the use of the PCI Terminals in future acquisition plans.

Bugg is a senior systems consultant with Ciba-Geigy Corp. at the firm's Hawthorne, N.Y., plastics and additives division.

SPECIAL **REPORT**

Expanding ATM networks draw consumers' interest,

By Robert W. Mahoney
Special to CW!

Our financial delivery and payment systems are radically changing. The rapid growth of electronic funds transfer (EFT) has been spurred by the consumer acceptance of automated teller machines (ATM), the growth of shared ATM and EFT networks and the proliferation of credit and debit cards.

In the near future, consumers will use ATM debit cards and self-service terminals to buy fuel for their automobiles, obtain coupons electronically for discounts on brand name merchandise, buy airline tickets, buy tickets to sporting events and concerts and even buy lottery tickets.

The customer will use an ATM debit card, which interacts with a terminal on-line to a data base, to pay for groceries at the supermarket, to purchase items from electronic catalogs and even to receive government benefits such as food stamps, aid to dependent children and unemployment compensation.

By the end of 1983, over 40,000 ATMs were in use across the U.S. More than 100 million ATM debit cards are now in consumers' hands. They are used to perform more than 3.4 billion transactions a year. These transaction numbers are projected to reach 10 billion annually by the year 1990.

The future scenario for ATM debit and credit cards includes automated ticketing to purchase transportation, entertainment and gaming tickets. Currently, Avis Rent-A-Car Systems, Inc. uses transaction terminals for its automated Avis Rapid Return service, letting customers return cars and receive a printed record of expenses.

Avis plans to extend that program to "Rapid Rental," wherein the customer can make reservations, receive a finalized contract and learn the parking location of the rented car by using a self-service terminal.

Self-service technology also offers the potential to automate government benefits distribution.

The distribution costs of government welfare programs are increasingly expensive. Studies conducted in several states revealed that the distribution costs for unemployment checks is $2 to $5 for each check; welfare checks are $7.50, and food stamps are $1.75 to $3.00. Couple these costs with transaction volumes that range from 150,000 to 200,000 per month in Arizona to 3.5 million to four million per month in New York, and the magnitude of this problem becomes more visible.

Add one more dimension to these numbers. There are 10.5 million people in this country receiving welfare benefits, 22.7 million on Medicaid and 21.6 million receiving food stamps. Both ATMs and point-of-sale (POS) terminals can reduce the costs of check dispersal and reduce fraud, which is a major problem with today's distribution system.

Perhaps a more current ATM issue is the growing number of joint ventures between financial institutions and retailers.

Today, there are approximately 245,000 convenience stores and gasoline stations. These locations are suited for self-service EFT devices because they are fast-service operations and many are open 24 hours a day. As a result, many large chains are installing direct debit scrip terminals, cash dispensers and automated fuel systems that allow customers to pay for their gas and convenience items either by cash, debit or credit card either at the island through an automated fuel system or in the store with a POS terminal.

Island fuel terminals operate like the ATM. Automated fuel systems control fuel delivery and pricing as well as payment.

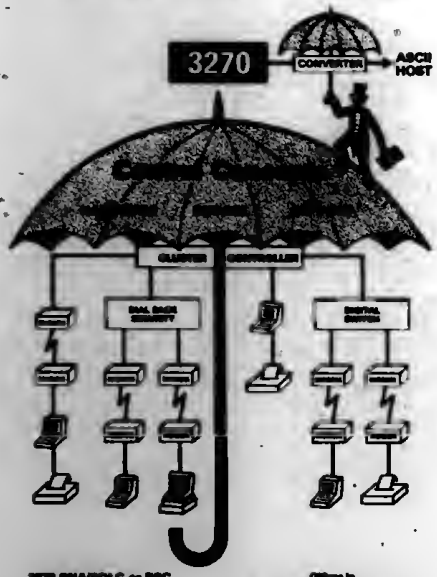
Cash dispensers are becoming popular with retailers who have high customer traffic. Why cash dispensers and not full-service ATMs? Facts indicate that cash dispensers are more cost-effective in this environment because of their lower purchase price and service costs.

The 29,000 supermarkets now in the U.S. are

Using an ATM, Avis customers that are returning cars can automatically process their rental agreements and receive a record of charges without talking to a rental agent.

Mahoney is president and chief operating officer of Diebold, Inc., a Canton, Ohio, manufacturer of automated teller/electronic funds transfer machines.

Everything Under the Umbrella



3270 SNA/SDLC or BSC

Call [illegible] to find out how Control Concepts can support your network needs. From modems to terminals, printers, and protocol converters, everything you need to take full advantage of your IBM host. Call us from home or a branch office with a personal computer. It makes sense to work with a company that can solve all your networking problems.

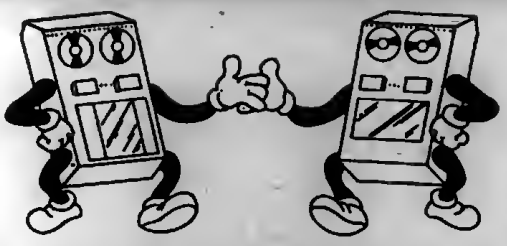
Offices in California, Texas, Illinois, Virginia

CONTROL CONCEPTS

P. O. Box 2307, Manassas, Virginia 22110
[illegible] In Virginia (703) 361-[illegible]
Telex No. [illegible]

"YOUR INTEGRATION NEEDS ARE UNDER CONTROL"

OUR SWITCHES MAKE YOUR IBM SYSTEMS WORK LIKE A TEAM!



If you have more than one IBM or plug compatible processor, Digital can help you get the most for your hardware investment. Our switches allow you to achieve backup and peripheral configuration flexibility at a fraction of the cost you're probably thinking.

Whether you have two processors or more, Digital has a switch to suit your requirements.

- Model 4101 The lowest priced matrix switch on the market.
- Model 3421 The only manually operated channel switch in the industry.
- Model 3403 A remote controlled channel switch designed for underfloor installation.

For More Information call toll-free 1 800 421-8265

DIGITAL CONTROLS

2779 Orchard Run Road • Dayton, Ohio 45449 U.S.A. • (513) 435-5455
Dallas 214-669-0088 New York 201-585-9416
Atlanta 404-284-0882

*Registered Trademark

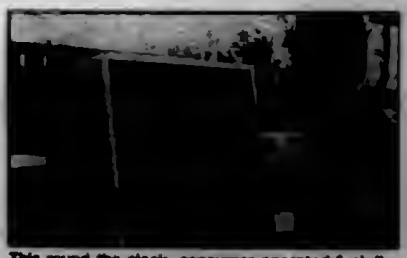
process 3.4 billion requests a year

probably best positioned as delivery points for financial services.

Another possible use of ATMs in the future is the placement of direct debit and check/credit authorization terminals in specialty stores within shopping centers. These networks would broaden the base of automated payment services and produce communications cost savings.

Clustering ATMs, cash dispensers and other payment terminals in a kiosk at the supermarket entrance, for example, in addition to preauthorization of debits, would allow a user to get cash, make a deposit, pay a bill, transfer money, authorize a check, obtain cents-off coupons and purchase items from an electronic catalog. The same system would provide the retailer with electronic security, access control and energy management systems for the store.

These self-service applications could double the projected annual ATM transaction levels to 20 billion transactions by 1990. If these assessments are correct, and some experts believe they are conservative, we are rapidly approaching a self-service, transaction-driven society.



This round-the-clock, consumer-operated fuel dispensing system can be activated by debit or credit cards.

GEAR from SR/16

a trial-and-error procedure for the DP department. Fortunately, vendor firms were involved in the process.

Despite the liabilities associated with early DP, user demand for system access steadily grew. Mainframe systems were overloaded as more lines were fed into the system. At the same time, operation and maintenance costs escalated. As work backed up, it became clear that a new configuration was needed between computer and terminals to make DP more cost-efficient.

The temporary solution was the distributed clustering of terminals to the minicomputer. This off-loading of the mainframe meant that not only could current work be done, but also that more users could access the system. As the number of users accessing the system grew, however, the resulting traffic problem produced exorbitant communications line costs and once again overloaded the host system. More complicated applications and higher application costs continued to add to the MIS manager's work load.

A better solution was a flexible synchronous terminal that saved transmission costs by capturing current data from the mainframe or mini and processing it right on the terminal itself.

Synchronous terminals became a cost-effective way to get work done. As more and more nontechnical users sought computer experience, user-friendly technology mushroomed. This development went hand in hand with across-the-board demands for flexible, tailored applications. And, invariably, as soon as a new application was developed by MIS, the local department manager requesting the application found one more task for MIS to fulfill.

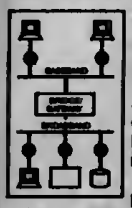
The introduction of faster data speeds, multitasking, data integrity, shared data base information and on-line computing further broadened the appeal of new technology. Office automation was well on its way. Today, many local department managers are solely responsible for seeing that the department needs are met.

LAN.
THE DECISION TO WAIT AND SEE JUST PAID OFF.

Now there is a company that can satisfy your LAN needs both today and ten years from today. A company with flexible solutions backed by over 20 years of networking experience.

Codex.

In the 4000 Series LAN, we offer a system that lets you configure and control the precise mix of LAN technologies that suit your company needs.



A system, for example, that lets you combine a broadband backbone for data, video and voice applications, and less expensive Ethernet baseband feeders to support individual work areas.

A system that supports a wide array of industry standard interfaces. So you can connect practically any vendor's equipment.

Later, when your needs for internetworking and network management expand, those needs can best be met by the company that has literally written the book on adaptive routing, network management, protocol intervention, and statistical multiplexing.

Codex.

We just made the decision to get into local area networking a safe decision to make.

For more information, call 1-800-821-7700, ext. 879. Or write: Codex Corporation, Dept. 707-79, 20 Cabot Boulevard, Mansfield, MA 02048.

codex
MOTOROLA INC.

© 1984 Codex Corporation.

FINALLY. HELP FOR THE DATA CRAZED.

Introducing Cypress,® Cedar,™ and Juniper.™ Three fast, friendly, infinitely applicable desktop ideas from ROLM.

It comes as no surprise that people react to technology differently. Dyed-in-the-chip techies thrive on it. True non-believers avoid it instinctively.

Now you can please all of the people all of the time. Honest.

Say goodbye to complicated log-on codes. Just push a button and—whoosh!—travel all the way to a data base, talk to a mini or access your IBM mainframe.

Say hello to speakerphones, phone books, message takers and calculators. Built right in.

If you want to take snapshots of data in your mainframe, there's Cypress. It's as easy as Point & Shoot. It's a smart little ASCII terminal integrated with a fully-featured digital phone.

Need a 512 KB, fully IBM-compatible PC that runs programs like pfs:graph,™ the IBM Assistant Series,™ 1-2-3,™ and lets you mini-network through your phone line? Cedar's the one.

Already in love with your IBM® PC or XT but crave the affections of Cypress? Ask for Juniper. Its one slot adaptor card lets your system keep growing. And growing.

Of course, only ROLM has Cypress, Cedar and Juniper. Because only ROLM has the system to run them on. At its heart is the CBX II, a breakthrough communications controller that manages voice and data over standard telephone wire. Simply, brilliantly and cost effectively.

And ROLM has the technical edge, the operational track record and the worldwide service and support organization to please even the toughest customer.

So phone ROLM. High tech. Not high anxiety.

ROLM

4900 Old Ironsides Drive, M/S 626 Santa Clara, CA 95050 • 800-538-8154. (In Alaska, California and Hawaii, call 408-986-3025.)

Trademarks: pfs:graph—Software Publishing Co., IBM Assistant Series—International Business Machines Corp., 1-2-3—Lotus Development Corp.

Migration path from VDTs key in agency's choice of micros

ALBANY, N.Y. — When users at New York's largest state agency here began asking for personal computing power, their data processing center gave it to them without giving up the advantages of a terminal system that was already installed.

The New York State Department of Mental Hygiene consists of the Office of Mental Health, the Office of Mental Retardation and Developmental Disabilities and the Division of Alcoholism and Alcohol Abuse. It is the largest government employer in New York, with about 70,000 employees, and has an annual budget of more than $2.7 billion.

The data center that oversees operations for the entire department, the Information Support System (ISS), has for two years operated a network of 440 IBM 3270-like terminals — mostly Mohawk Data Sciences Corp. (MDS) 2192s and some other VDTs from Racal-Milgo, Inc., Raytheon Co., Memorex Corp and IBM.

Terminals in the network are controlled by 187 MDS Series 21 distributed processing systems. The network is linked over bisynchronous data lines to an 8M-byte IBM 4341 and a 12M-byte Honeywell, Inc. DPS 8/70.

Agencies within the department use the terminal system to maintain patients' medical histories and to trace drugs that are administered, so as to prevent the possibility of adverse interactions.

The department also keeps track, through the mainframe data base, of the $800 million in billings it sends out annually for its health care.

George Syrett, director of technical services and systems operations for ISS, said providing users with access to such mainframe data is crucial. "I don't believe people are islands," he said. "They have to connect."

When users asked for personal computing power, ISS chose MDS Hero networked personal computers over other products, chiefly because the machines could provide a migration path from the current network.

He explained that just about any box can provide desirable personal computing abilities, but that none but the Hero allowed the department a convenient migration path from its terminal system.

ISS installed 85 Heroes this spring and plans ultimately to link them and other Heroes it has ordered to the mainframes over private leased data lines and to eliminate the Series 21 controllers. But the switch to the private lines will take about two years, in part because of AT&T's line installation backlog.

"Part of our problem is that we can't get telephone lines, so we can't get a network," Syrett said. ISS is relying on the Series 21 migration path to pull it through the interim.

It is working to tie some of the Heroes into the terminal-mainframe system through the Series 21 controllers. A Zilog, Inc. Z80 chip in the Series 21 switches the Hero's asynchronous transmissions to bisynchronous so the information can travel to the mainframes over data lines.

Mainframe access

"The MDS Hero accesses the mainframes' host computing resources and data bases, allowing users to interrogate the data locally then integrate it into an MDS Hero application," Syrett said. This gives users the freedom of a [personal computer] and the power of the mainframe."

Four Heroes currently access the mainframe as 3270 look-alikes through a drop network. The machines are fitted with emulation software that makes them appear to the IBM and Honeywell mainframes as 3276s.

Until they can be linked to the network through the Series 21s or through the permanent data lines, most of the other machines will serve as stand-alone systems for word processing, for spreadsheets and for evaluating different health programs.

IN HEAD-TO-HEAD COMPETITION, OUR NETLINK BEAT THE TRUNKS OFF EVERY COMPETITOR.

We recently asked a number of data communication users to test our DCA Netlink on-site against any competing product. In every trial, against all comers, Netlink won. With a flurry of hard-hitting features.

The most telling blow: its data-voice-compressed video combination. Netlink can deliver all three simultaneously at various speeds. Via leased lines, microwave, laser, satellite, fiber optics—whatever transmission mode you use.

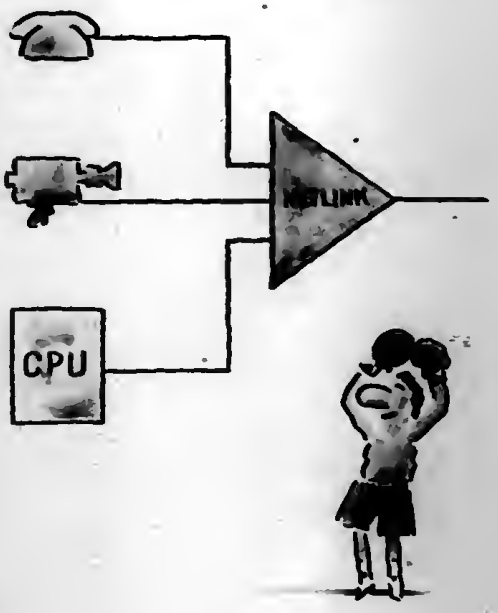
It can handle speeds of 50 bps to 2.048 million bps and transmit voice at low speeds without losing quality or speech recognition.

Because it's software driven, you can change channel speeds and configurations with the touch of a console. Or you can program it to change configurations at predetermined times.

And because it's an advanced time-division multiplexor, it is completely transparent and compatible with all your voice, image and data communications equipment.

So why not give it a shot. You'll discover as others have that for power, speed and flexibility, the DCA Netlink can't be beat.

For more information, write DCA, 303 Research Drive, Norcross, Georgia 30092. Or call toll-free: 1-800-241-5793.



dca
Digital Communications Associates, Inc.
DCA Products Are Available Worldwide

DAVOX

In 24 months, we helped Polaroid develop a whole new communications picture.

SPECIAL **REPORT**

Wise terminal makers will heed end-user demands

By Allen Maurer
Special to CW

The times are changing for VDT suppliers. The rapidly maturing end-user market is demanding more than a dumb box and is looking increasingly to multifunctional, interactive desktop devices and personal computers for its data processing and communications needs. The trend is definitely toward smart.

Demand for personal computers and intelligent workstations continues to grow at an astounding rate. An estimated 25.5 million personal computers will have been sold in the U.S. by 1987, according to a prediction by Dataquest, Inc. The demand for conversational and editing terminals is also growing, but much more slowly. Approximately 5.5 million such terminals will be installed by 1988, according to a study by Advanced Resources Development, Inc.

What all this means is an increased demand in the next five years for systems rather than terminals. CRT terminal suppliers will either have to branch out to satisfy workstation needs or become casualties of the inevitable shakeout in the terminals market.

The terminals market is not faltering, however. Personal computers cannot answer all the needs of business systems users. The two factors that will favor the growth of terminal products are cost and the need to disperse information and functions among a number of workers. But it is clear that the market must adapt.

The largest segments of data entry terminals comprise three distinct groups of equipment and represent 63% of the domestic data entry terminal base: Editing CRT terminals (IBM 3270-type compatible) have roughly 24.5% of the overall market; conversational CRT terminals represent about 23% of the market; and editing CRT terminals of the non-IBM 3270 type have about 15.5%. These numbers exclude key-to-storage-oriented units that represent approximately 3% to 4% of the overall data entry market.

A growth rate of 69% is expected in this market by 1988 with growth expected in these three areas:

- 25.9% in 3270-type editing terminals.
- 23.4% in non-3270-type editing terminals.
- 19.2% in conversational terminals (representing a 4% drop in share).

Clearly, the non-3270-type editing terminals will show the strongest growth, with conversational terminals taking a drop.

The increasing use of business graphics points to growth in the graphics terminals market as well. A study by Venture Development Corp., based in Wellesley, Mass., shows a projected 29.9% compound annual growth in dollar shipments of graphics terminals. Inexpensive raster-scan graphics displays will no doubt have the lion's share of the market, provided a high resolution is offered. In the meantime, graphics terminals continue to offer smaller suppliers a means of competing with larger, more established firms.

Some producers of terminals have tried to find a new profit niche for themselves in the personal computer market. The danger, of course, is in entering a market that is chock-full of competition and one that is already dominated by a few of the big guys who leave little room for others The diversion of energies and resources from terminals manufacturing and marketing to computers can be a fatal drain. The workstation and intelligent terminals market represents a more effective course for a terminal producer to take.

Industry studies indicate that by 1988, the market will be dominated by devices designed specifically for workstation functionality — true management workstations. The proliferation of workstations is attributed to several cited trends. Among them is the increasing availability of multifunction, interactive products. The ease with which components can be integrated and interchanged, particularly with the emergence of the Ansi communications protocol.

Advances in technology have increased performance to such a point that intelligent workstations can now be adapted to virtually any application. Fewer compatibility barriers and emerging standards will make it easier to choose a multiuser system over a personal computer.

An additional factor that cannot be ignored is the new awareness on the part of the end user that these technologies can be useful at all levels of office operations.

This new, aware market will find terminals with local intelligence and graphics attractive. Word processors that are multifunctional and supermicros such as the IBM Personal Computer AT and others have increased the options for communications and expansion. Small systems in particular, with easily integrated components and software supporting a number of users with different needs, should continue to be a significant portion of the multiuser mart.

Maurer is the vice-president/marketing for Esprit Systems, Inc., a manufacturer of graphics and data communication terminals based in Melville, N.Y.

Pay less for more.

VP4801 APT, $348*

Get RCA quality and performance.

OEM designers and systems integrators can now utilize the many performance features of RCA communication terminals, at most attractive prices.

The RCA APT (All-Purpose Terminal).

Professional quality RCA APT terminals are designed for remote data base timesharing and direct computer-connected applications. They feature a built-in 300 baud direct-connect modem, an RS232C interface for high speed modem and other accessories, and a parallel printer port for hard copy. Menu controlled operation and a "programmable personality" can match specific requirements for each data base.

VP4801 APT, $348*

Full 60-key typewriter-style keyboard with 16-key calculator keypad. Auto-dial (tone or pulse) of up to 26 stored numbers for voice or data base calls. Programmable sequences initiated automatically after log-on. Two user keys for selection of printer or other operating modes; four programmable function keys, shifitable for a total of eight functions. APT can be programmed to match the communications requirements and control commands of many other (and more expensive) terminals. Briefcase size (17" × 7" × 2"), light weight (under 6 lbs.) and memory backup (minimum 48 hrs., without batteries) enhance portability. Many other user-friendly features.

VP3801 APT, $348*.

Same features as VP4801, in rugged metal case with flexible membrane keypad, designed for dependable performance in hostile environments.

VP3801 APT, $348*

VP3301 Interactive Data Terminal, $307*.

58-key flexible membrane keyboard with finger positioning overlay includes two definable user keys. Full RS232C interface for direct modem and computer connection. Six switch-selectable baud rates from 110 to 19.2 kilobaud. Full color graphics and reverse video. 40 character × 20 lines or 20 × 12 display formats. Video output for 525-line color or standard monochrome monitor. Size: 13.1" × 7" × 2". Weight: approx. 5 lbs.

VP3301 IDT, $307*

To order, call toll-free 800-233-0094.
(In PA, 717-295-6922.)
For more information, call 800-233-0187.
Or write: RCA Data Communications Products, P.O. Box 3140, Lancaster, PA 17604-3140.
*OEM quantity prices, 25 units.

VP4801 APT with optional display monitor.

RCA

NCR

SPECIAL **REPORT**

Rise of automated office accompanied by continued

By G.S. Thachenkary and S.E. Harris
Special to CW:

The emergence of the automated office has brought with it a bevy of purported VDT-related ailments and a controversy over VDT health hazards. In a survey conducted by the Data Entry Management Association (Dema) in 1984, over two-thirds of those responding had experienced eye strain, back pain, fatigue and neck/shoulder pain; over one-third reported burning eyes and general irritability.

In West Germany, over one-third of the health insurance costs for women office workers are due to an increased incidence of back- and neck aches. In both the U.S. and Canada, women operators have questioned VDT emmitance of low-level radiation and its possible effect on pregnant women.

In 1983, the Canadian Center for Occupational Health and Safety found that some VDT models leak extremely low-frequency radiation and linked exposure to low-frequency radiation with reproductive defects in laboratory animals. Research in 1982 by Dr. Jose Delgado in Madrid claimed that exposure to extremely weak pulsed magnetic fields, similar to the magnetic field pulses from a VDT's fly-back transformers, caused changes in chicken embryos.

Because the more serious health problems are suspected to be caused by the emittance of low-level radiation, government agencies such as the National Institute of Occupational Safety and Health (Niosh) and the National Academy of Sciences have carried out preliminary studies. A major advocate for closer monitoring and testing of VDTs is 9 to 5, the National Association of Working Women. At this time, significant evidence of VDT links to radiation and health problems has not been established.

While the controversy continues, mounting pressure from employee organizations has prompted close to two dozen states to consider legislation regarding the use of VDTs in offices. Some states, such as Connecticut and Maine, have already passed bills; others are still discussing them.

As legislatures across the nation consider the issues pertaining to the use of VDTs in the workplace, the Computer Business Equipment Manufacturers Association (Cbema) has formed a heavily financed lobbying group that has lobbied against VDT bills in California, New York and Ohio. The bill introduced in California was defeated.

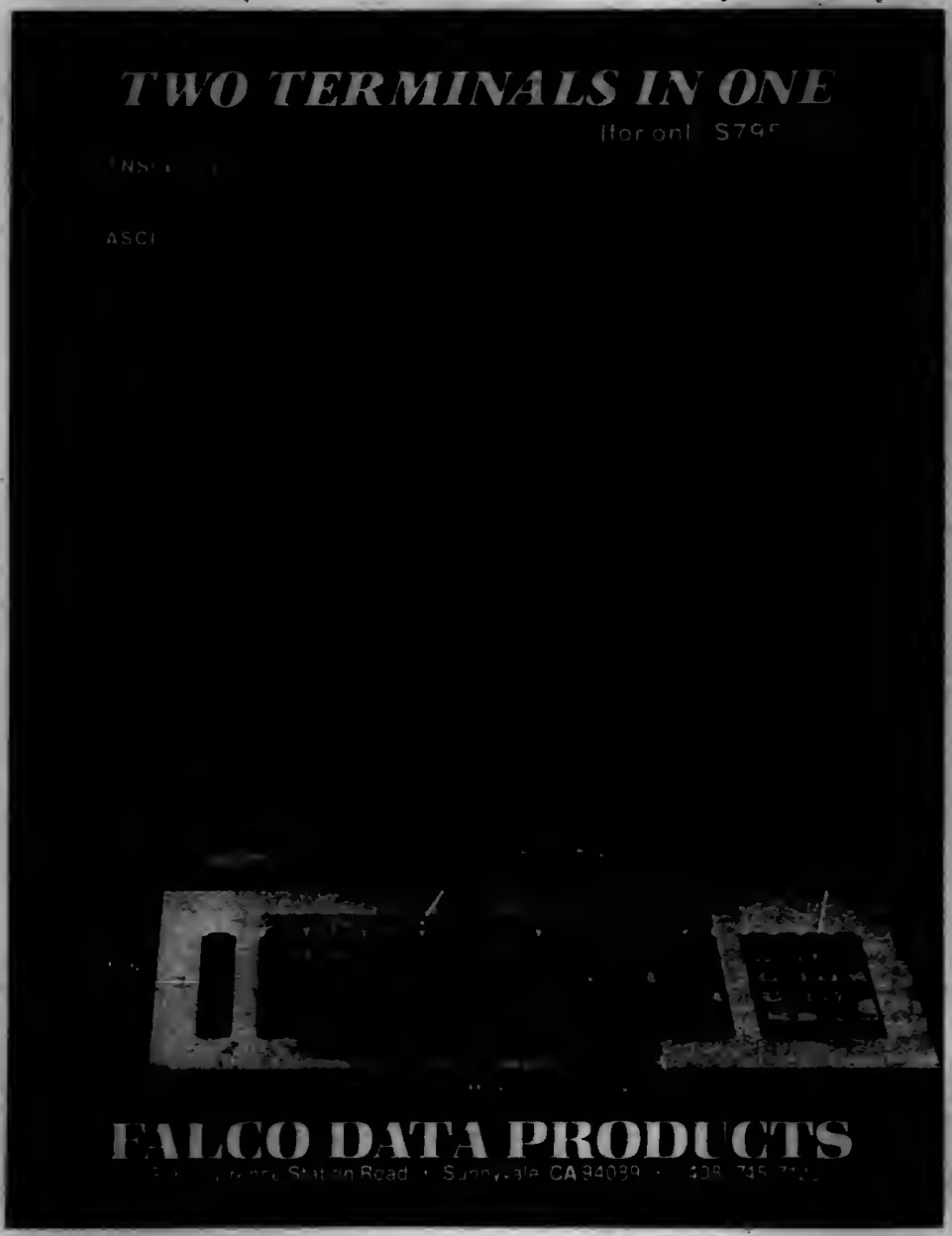
Obviously, management needs and user concerns must be addressed. An ergonomically designed office promotes both user comfort and productivity. The cost of providing ergonomically improved systems can be readily justified in terms of better health and greater productivity of office workers.

The modern workstation has three principal components: the user, the VDT-based office information center and office and office furniture.

■ The user. To ensure user comfort and health, be aware of any pre-existing health problems on your staff that might be aggravated by working in an automated office. Encourage periodic physical examinations and health maintenance.

■ The VDT. Progress is being made in VDT-based office information systems. This includes the advent of detachable keyboards, tilting/swiveling screens with amber or green displays, and screens and keyboards constructed of glare-reducing materials. Detachable and modular components significantly improve a system's ergonomics.

A 1984 study conducted by Niosh found that data entry workers using ergonomi-



Thachenkary and Harris are members of the decision sciences faculty in the College of Business Administration at Georgia State University in Atlanta.

debate over possible VDT-related health hazards

cally designed terminals were measurably more productive.

A drawback of the CRT found in today's VDTs is the flicker of the image on the screen. Furthermore, VDT screens display information on a vertical plane. Most people read naturally on a horizontal plane with their necks slighty bent forward. When users are working on a VDT, their necks are forced to be in a straight and upright position. Flickering VDT images and postural stiffness can cause eye irritation and body aches.

Flicker-free images

Recent developments in plasma display technology, for example IBM's 581, make use of neon and argon gas enclosed between thin glass plates to produce stable, flicker-free images. These screens do not emit electromagnetic radiation, and they have the added advantage of being flat panel displays rather than boxy CRTs. They can also be moved easily and are less bulky.

■ The office and office furniture. Office furniture should feature orthopedically designed chairs that provide firm support for the back and allow individual height and seat adjustments. The most radical of such designs is the so-called balance chair, which has no direct back support.

An American Productivity Center survey of large organizations found that improved furniture design can increase productivity by about 12%. Additional payoffs include fewer sick days, better labor-management relations and the reduced potential of litigations and court actions to resolve health complaints. A number of organizations, including TRW, Inc. and the Canadian firm London Life, Inc., have begun to assess the ergonomic soundness of their systems and physical facilities.

The design of an ergonomic environment also includes a comprehensive physical facilities-planning program. This program helps to focus management attention on the problems of acoustics, heating and cooling, lighting, air circulation and the layout of power cables in an ergonomically designed building.

Another trend to watch is that of the so-called intelligent buildings, such as the Citiplace in Hartford, Conn., operated by Building Systems Co., a United Technologies Corp. subsidiary; and the Concourse in Atlanta, managed by MCC Powers and the Landmark Group.

Intelligent buildings are fully wired office complexes. Their construction includes a complete package of computer and communications facilities, including local-area networks, digital private branch exchanges, a mainframe computer center, satellite antennas and a host of end-user support services such as user training, security and energy control.

The cost of ergonomically improved systems can be justified in terms of better health and greater productivity of workers.

Organizations with a high level of OA should consider appointing a chief ergonomics officer. The ergonomics manager, with a background in human factors engineering, man-machine interface, physical facilities planning and environmental psychology, should develop and enforce ergonomic standards throughout the entire corporation.

This new approach to corporate management stresses not only the use of advanced technologies to increase productivity in the office, but also the development of a physical facilities plan that addresses ergonomic issues.

The International Software Market for the world's Software Industry

The Montreal International Software Market (MIM) is the first truly international exhibition and conference exclusively for the world's software trade.

Montreal, Canada June 3, 4, 5, 1985, is the setting for this unprecedented global interaction of software professionals — buyers, sellers, importers, exporters, authors, distributors and volume end-users.

EXHIBITIONS
- Software for micro, mini, mainframes
- Products & related services

CONFERENCES
- Product design & development for export
- Export profitably
- Software & copyright protection

WORKSHOPS
- How to access world markets
- Trading patterns
- Export problems & solutions

MIM85

Montreal International Software Market
300 Leo Pariseau, suite 1919
P.O. Box 1119, Station LaCite
Montreal, Quebec, Canada H2W 2P4
Tel: (514) 288-8811 Telex. 055-62495

Please send me more information on MIM 85 Conference & Exhibition, in English ☐, in French ☐, for: exhibit ☐ attendance ☐

Name _____ Title _____
Company _____
Address _____ City _____
Country _____ Zip Code _____
Telephone _____ Telex _____
Please check the appropriate box. Type of products _____
Buyer ☐ Producer ☐
Distributor ☐ Other (specify) ☐

POS system keeps bookstore personnel in the know

KNOXVILLE, Tenn. — The bookstore at the University of Tennessee here uses a point-of-sale (POS) terminal system to help it prepare for and survive a quarterly onslaught of students. "Speed and accuracy are essential when nearly 30,000 students hit the bookstore in three or four days to get their books," said Wade D. Meadows, the school's director of bookstores.

The University of Tennessee Book and Supply Store, which carries 3,800 textbook titles during each scholastic quarter and registered $7.3 million in sales last year, uses a system based on 31 NCR Corp. Model 2152 POS terminals. The system also includes two NCR Model 751 concentrators; a 512K-byte Honeywell, Inc. Level 6 supermini, fitted with Ultimate Corp.'s Ultimate operating system; and Applied Information Systems, Inc.'s Ratex software for bookstores. It has been in place since April 1983.

'We can gather any information we want and report it in virtually any way.'
— Wade D. Meadows, director, University of Tennessee Book and Supply Store.

During the rush of student book buying, the POS terminals allow cashiers to check students out within an average of four minutes, according to William C. McCarter, the bookstore's assistant director and operations manager. In those four minutes, the automated system enables the bookstore to gather data that allows it to monitor its inventory and make informed decisions about what books to order, in what quantity, for the future. Cashiers pass wand readers over book tags that are printed in optical character-recognition type. Information includes the book's price; its 12-digit International Standard Book Number (ISBN), which identifies the book by title and edition; and its sales class, such as whether it is a new, used or reference book. The POS terminals transmit the data to the two Model 751 concentrators, which pass it through an interface and onto a disk of the Honeywell supermini. The bookstore updates its inventory and other records nightly, McCarter said.

From this information, the store's system produces reports that help its two textbook buyers plan future orders. Because the school is on a quarter system, the bookstore must order books four times a year. The longest lead time allowed to the buyers is about 10 weeks before a quarter starts, which McCarter said "does push things a little bit."

Once every quarter, the buyers have the system generate a course history report for their use. The report includes information about textbooks from courses offered during the past 10 quarters. For all courses from those prior quarters, the report lists the estimated enrollment and actual enrollment along with the number of books purchased by students in the class. The buyers use the report and requisition forms provided by the school's academic departments to help predict the number of books a scheduled class will need.

One of the buyers, Mitchell P. Borden Jr., assistant director and textbook manager for the bookstore, said the reports provide him with "the data I need to make intelligent buying decisions — not data just in raw form, but in the format I need."

He said information from the report has allowed the store to reduce its inventory by about 10% and to increase its inventory turnover from six times a year to seven.

Another report, one the system generates daily, gives the bookstore current information about inventory levels. For each title the store stocks, the report subtracts the number of books that the terminals record as having been sold during the day from the number of books the store had in inventory at the beginning of the day. The report also includes information on how many copies of the book have been sold in the month to date and the year to date.

Other information the system generates daily includes:

- An accounts receivable update.
- A record of cash discounts, accounts receivable and proof reports from each terminal, which is used for balancing.
- Buy-back reports.
- Data on use of bank cards and checks.
- Cash over or under and voids, listed for each cash register.
- A sales error report, which lists incorrect, illegible or missing ISBN numbers from the day's sales.

The system also generates reports on demand to monitor credit card transactions, purchases made by check and other variables. "We can gather any information we want and report it in virtually any way," Meadows said. "Consequently, reporting overall is much better than in the past, [as] is cash control."

IBM 3270 Compatible!

Do you use:

ATMS SCRIPT
etc PROF
eMAIL?

Our Model 736 Letter Quality Printer plugs right in and gives you automatic selection of cut sheets from two trays without making any software changes on your present IBM system.

The ISI-736 is plug compatible with the IBM 3287 for on-line printing from your IBM system. It works with all popular word processing packages.

Unlike the IBM 5210, it requires no expensive software changes to the system. Simply plug it in and it feeds cut sheets selectively from two hoppers under program control.

With multiple fonts and separate pitches, it will support most languages. Other features include underscoring and boldface capability.

Call, write or TWX us today!
We sell, lease and service nationally.

Interface Systems, Inc.

5855 Interface Drive, Ann Arbor, MI 48103
Telephone: (313) 769-5900, TWX: 810-223-6058
or call toll free 1-800-544-4072

Ask about the ISI-487, too, a high speed dot matrix printer that allows you to tear off output immediately, without wasting forms. Also prints large characters for labels.

THE PANASONIC SR. PARTNER NO PERIPHERALS NEEDED

Panasonic

* One year limited warranty. Exclusive on thermal printer head. Carry in or mail in service.
is the trademark of Microsoft International Corporation; VisiCalc is the registered trademark
Publishing Corporation; and BASIC, MS-DOS are the trademarks of Microsoft Corporation.

To begin work on any production process, a worker must log on to a Honeywell 3305 terminal and key in information about the work he plans to do.

develop
Reliability.

Food lab's work flow monitored by terminals

ALSIP, Ill. — A laboratory here that supplies seasonings and ingredients to the food industry depends on a system of data entry terminals to make sure its many chefs do not spoil tha broth (or the pancake mix or meat tenderizer, for that matter).

Griffith Laboratories USA, Inc. is one of the world's largest suppliers of seasonings and food ingredients. At its manufacturing plants here and in Union, N.J., Union City, Calif., and Lithonia, Ga., Griffith produces about 16,000 different seasonings and ingredients for 8,000 commercial processed food manufacturers, distributors, restaurants and institutions. It has 38 recipes for barbecued potato chip seasonings alone.

About 600 employees at the four manufacturing plants produce the ingredients, and a shop floor data collection system, the Factory Management System (FMS) from Honeywell, Inc., coordinates the employees' work through every step of production.

The FMS at each manufacturing plant consists of:

- A 1M-byte Honeywell DPS 6 minicomputer.
- Ten Honeywell 3305 terminals that guide employees through the production process.
- Twelve Honeywell 7200 CRT terminals used for data entry and work-in-process inquiries.
- Two Honeywell 3301 terminals that monitor employee attendance.
- Honeywell's FMS software, which runs the different terminals in the system.

To begin work at any stage in the production process, an employee must log on to a Honeywell 3305 data collection terminal and key in his intentions. FMS keeps track of each stage, so if an employee tells the terminal he wants to perform work that has already been completed or perform a step out of order, the system advises him against it.

According to Robert Brunson, Griffith's MIS director, "One particularly helpful aspect of FMS is that it helps avoid conflicting labor reports, and it tracks job progress according to our preset standards."

When employees in Griffith's customer service department receive an order from a customer, they enter information about the order into the DPS 6 via one of the 7200 terminals. The mini produces documents, such as recipes, to guide production work. A production scheduler receives these documents, and he schedules production work at the manufacturing plant. Most orders go into production within three days after they are received, Brunson said.

At the manufacturing plants, each order follows a production process that has seven set stages:

- Staging. Employees gather standard-size packages of ingredients from warehouses for use in the recipe.
- Batching. Employees gather the remainder of an ingredient called for in the recipe.
- Mixing. Employees follow the recipe to put the correct amount of ingredients into a mixer at specified times.
- Quality testing. A sample of the product is sent to Griffith's laboratory, where it is tested against the client's standards.
- Dumping. The mixture is unloaded from the mixer and loaded into bulk containers or sent via conveyor belt to the packaging department for division into smaller containers.
- Packing. The mixture is packaged according to customer specifications.
- Weighing. Each case of the product passes over a scale, and cases that do not pass muster are pulled from shipment until their weight is corrected.

Employees key information into the shop floor system via their 3305 terminals to signal the beginning and end of each task within each production stage, and the information is recorded on the minicomputer. When customers call to check on work in progress, customer service employees make inquiries through their 7200 terminals and provide up-to-the-minute reports, Brunson said.

He said tha system also keeps track of the time employees take to finish each task, and customers' bills reflect the amount of time it takes the firm to process an order from beginning to end.

Employee attendance data is recorded on the system through the 3301 terminals. Whenever an employee enters or leaves the manufacturing plant, he must insert a punch card — bearing his employee number — into one of the 3301s. The machines read the employee number and time of entry or exit and register the data on the DPS 6. Griffith uses the information to process its payroll and to keep track of employees' sick days.

The firm transmits information daily from the DPS 6 over Wats lines, through a Honeywell Datanet 8 front-end processor and into a 3M-byte DPS 7/55 mainframe at headquarters here. Brunson said Griffith's management uses information from the shop floor data collection system to help it measure production.

The firm plans to integrate the shop floor system into an overall manufacturing resource planning system within two years, according to Brunson. The system Griffith envisions will provide resource management from the time the firm orders raw materials through the time it ships a finished order to a customer.

SPECIAL **REPORT**

Fiber optics offers prudent alternative to EIA choices

Communications speed, distances increased without degrading signal quality

By James B. Bartula
Special to CW:

With the advent of fiber-optic communications in the computer industry, managers are now faced with choosing between fiber-optic VDTs, communications boards and cables and their more traditional Electronic Industries Association (EIA) counterparts.

The advantage of using fiber-optics hardware and cables is the increased distance from one communications point (such as a VDT) to another (such as a host computer) that they provide. The need for many short-haul modems is eliminated when fiber optics is used. Current fiber-optic VDTs can be located 1,000 meters or 3,280 feet from a host without the need for short-haul modems.

Another advantage of fiber optics is the speed that light pulses can travel through a fiber cable. Fiber-optic products can communicate at top speeds from 19,200 to 38,400 bit/sec over a 1,000-meter fiber-optic cable. This can be contrasted with the 1,200 bit/sec speed for a 914-meter EIA RS-232C cable, which is the maximum length of cable allowed by the Texas Instruments, Inc. EIA Distance Policy (see story below).

Light is divided into different frequencies. When light is passed though a prism, each frequency emits its own color varying from red to violet. Each light frequency or color is several orders of magnitude higher than the highest frequencies that are now used in the copper wires of computer communications. The higher a given frequency of light, the more information that frequency can carry. For example, a single 125-micron diameter (about the size of a human hair) fiber-optic cable can carry the same amount of information as 900 pairs of copper wires.

High data transmission rates require high-frequency signals. When signals between VDTs and their host computers are carried through copper cables like RG-58/U, 59/U, 62/U, 14/U and 19/U, the signals suffer increased degradation as frequency increases.

As the distance from a VDT to a host computer increases, the signal carried by copper wires is degraded. This signal degradation or "attenuation" occurs because copper wires offer resistance to the flow of the electrical signals they carry. Also, attenuation in copper wires increases as the frequencies going through them increase (See figure 1). Because faster data rates require higher frequencies to carry additional information, these faster data rates result in a high attenuation. This characteristic of copper wires makes them difficult to use in high-speed, long-distance communications.

In contrast to copper wires, the attenuation of fiber-optic cables remains flat as the frequency of the light going through them increases.

Fiber-optic cable with less than one decibel (a decibel is a measurement of loss) of attenuation per kilometer is now available. It is the ability to carry high frequencies with low attenuation and more data at faster data rates over longer distances.

Another advantage of fiber optics is that is it dielectric; it does not emit electromagnetic energy. Fiber-optic cables do not require special shielding to comply with the Federal Communication Commission's electromagnetic interference regulations.

Its dielectric properties make fiber optics suited for use in electrically "noisy" environments. Copper wires can pick up electrical energy emitted by machinery in a noisy environment, transmit it to a host computer or VDT and thus cause malfunctions.

Additional advantages of fiber optics include:

- Increased data communications security. It is almost impossible to tap into fiber-optic communications without affecting the transmission enough to be detectable.
- Space constraints. Fiber-optic cable is smaller and lighter than copper cable.
- Fiber-optic products are safer from electrostatic discharges or electrical storms.

Fiber optics has made its debut in the computer industry. Its advantages will lead many computer users to consider and select fiber-optic equipment.

Bartula is a Product Manager for business system computers with the Data Systems Group of Texas Instruments, Inc. in Austin, Texas.

Cable distances for TI products

Texas Instruments, Inc's. Electronic Industries Association (EIA) Distance Policy states recommended distances between terminals and printers and their host when EIA RS-232C cable is used. TI sanctions operations at distances up to 15 meters, but does not guarantee error-free operation beyond that distance.

The table to the right lists the maximum lengths of EIA RS-232C cable and the associated maximum speed that is used with TI products. To operate at maximum distances, end users must meet restrictions on the types of data equipment used, electrical environment, cable construction and cable wiring.

The table shows that the maximum EIA RS-232C cable length is 914 meters, but this distance can only be attained when using a communications speed of 1,200 bit/ sec. The fastest speed available over EIA RS-232C cable is 9,600 bit/sec; this speed can only be attained at a maximum distance of 122 meters.

The maximum speed at which terminals and their hosts can communicate over TI's EIA RS-232C cable decreases as the distance between the machines increases.

SPECIAL **REPORT**

Investment in ergonomics can pay healthy dividends

By Robert L. Barcus
Special to CW

Office ergonomics can affect productivity and profits as well as employee morale, safety and health. The National Institute of Occupational Safety and Health reported that an ergonomically sound automated workstation can boost productivity by more than 30%.

The expansion of computer technology into every facet of office activity has dramatically changed the character of today's office. Local-area networking and word processing, for example, have made marked improvements in office output. The human factor in office automation, however, was neglected in the rush to automate the workplace. As a result, complaints of eye- and back strain and questions of radiation-related pregnancy and eye complications have cost U.S. businesses millions of dollars (see story SR/26).

Many corporations now carefully evaluate their seating, lighting, computer-support furniture, acoustics and wire management systems to ensure that new and existing OA installations are ergonomically sound as well as cost-efficient and profit-boosting. The following topics should be considered when designing an ergonomically sound office environment.

■ Seating is a primary concern for worker comfort. Offices should be equipped with chairs that fit user, not designer, specifications. Chairs should be adjustable at the seat and back to fit the user and provide proper lumbar support. Furthermore, a chair's design should reduce pressure on the arms and upper legs and behind the knees. A properly fitting chair and regular rest breaks away from the workstation (some industry groups suggest 15 minutes every two hours) are effective ways to reduce back strain and provide greater comfort.

■ Computer support furniture, such as tables and desks, should be another management concern when designing an ergonomically sound office. Tables and desks should be adjustable. In addition, tables that support VDTs should include mechanisms, such as a cantilever, for altering the work surface and the keyboard shelf positions.

Currently, retractable articulating keyboard shelves are popular with occasional computer users. These devices support the computer keyboard and can be adjusted both vertically and horizontally. When the computer is not being used, the shelf retracts and rests under the work surface. Unfortunately, many of these shelves protrude four to seven inches below the work surface, restricting leg movement. The best option in a keyboard shelf is one that retracts, then swivels to a 90-degree angle below the work surface, freeing the legs to move as needed.

■ Lighting and acoustics play a major role in worker comfort. Poor lighting can cause eye strain, which can lead to headaches and dizziness. One way to cut down on eye strain is to select terminal screens that tilt and to outfit the screens with glare-reducing filters and hoods. Also, consider the light source. Lights should be positioned so that they are neither directly behind nor directly above the seated worker.

Ambient lights are one way to provide low-glare lighting. Ambient lights reflect light off the ceiling, creating an umbrella effect of softer light, which reduces glare and shadow. Ambient lighting offers other benefits as well. Because they are not necessarily stationary, these lights can often be moved to accommodate a new office layout. In addition, because, for tax purposes, these lights are recognized as furniture, their amortization schedule is attractive.

The most reliable method of determining if your staff is comfortable in the automated office is to ask them.

One cost-efficient solution to lighting problems in an open-plan office is to use properly designed ceiling fixtures supplemented by panel-hung task lights. Task lights also brighten shadowy work surfaces.

■ Excessive noise can affect worker productivity. One way to reduce noise in this situation is to use wider, 3½-in. thick, sound-absorbing divider panels and situate furniture and lighting fixtures to reflect and dissipate sound.

■ Wide panels also increase an office's wire management options. Increased panel widths have a greater capacity for both designated and dedicated power lines at the base of

See HEALTH SR/36

Barcus is director of national accounts for Shaw-Walker Co., a Muskegon, Mich., manufacturer of office furniture and systems.

Until now, if you wanted in-depth editorial on today's hot issues, one thing's been missing.

INTRODUCING COMPUTERWORLD FOCUS. A new breed of publication with in-depth information on today's hottest topics. It's called Computerworld Focus. And it just may be the brightest, smartest, most efficient way you'll ever reach your customers and prospects.

Computerworld Focus is issued 10 times a year – with the express purpose of analyzing the hottest topics of the day. Not just lip-service, but in-depth editorial, expert views, user opinions, market research facts, analyses, predictions and more.

Who can you reach with Computerworld Focus? Hundreds of thousands of your prospects and customers. Start with Computerworld's over 126,000 paid subscribers, then add a high pass-along readership, plus bonus distribution at major trade shows.

Since each issue is devoted to a specific topic, you can target your media buy better than ever before. And with help from our March issues, you can even evaluate the effectiveness of your ads.

So take a look at the topics we'll be dealing with. Then clear the decks for some of the most cost-effective advertising you'll ever do.

Computerworld Focus Issue	Issue Date	Closing	Show Distribution
UNIX™	JANUARY 16	DECEMBER 7	UNIFORUM
OFFICE AUTOMATION	FEBRUARY 6	JANUARY 4	OAC '85
MICROCOMPUTERS: SOFTWARE	MARCH 20	FEBRUARY 8	SOFTCON
BUSINESS GRAPHICS	APRIL 17	MARCH 8	NCGA
SOFTWARE: APPLICATIONS	MAY 8	MARCH 29	COMDEX/SPRING
MANUFACTURING	JUNE 19	MAY 10	AMS '85
NETWORKS	AUGUST 29	JULY 15	TCA
SOFTWARE SYSTEMS	SEPTEMBER 18	AUGUST 9	SOFTWARE/EXPO
OFFICE AUTOMATION	OCTOBER 16	SEPTEMBER 6	INFO '85
MICROCOMPUTERS: HARDWARE	NOVEMBER 20	OCTOBER 11	COMDEX/FALL

©1984 Computerworld Publications

For more information, contact Edward P. Marecki, National Sales Director, at (617) 879-0700. Or call your local sales office listed below.

COMPUTERWORLD FOCUS

We put the hottest issues of the day in Focus.

Sales Offices: BOSTON: 375 Cochituate Road, Box 880, Framingham, MA 01701 (617) 879-0700 NEW YORK: Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652 (201) 967-1360 CHICAGO: 2600 South River Road, Suite 304, Des Plaines, IL 60018 (312) 827-4433 ATLANTA: 1400 Lake Hearn Drive, Suite 330, Atlanta, GA 30319 (404) 394-0758 HOUSTON: 8401 Westheimer, Suite 110 Houston, TX 77063 (713) 952-1220 LOS ANGELES: 18009 Sky Park Circle, Suite 280, Irvine, CA 92714 (714) 261-1230 SAN FRANCISCO: 300 Broadway, Suite 20, San Francisco, CA 94133 (415) 421-7330

Device upkeep maximizes benefits, minimizes costs

By Steve Aaron
Special to CW!

Whether a company has 200 terminals or a single user, the benefits of good service and proper terminal maintenance means maximized uptime and cost-effective servicing.

Technological advances and the increased user dependence on computer systems has changed the way terminals are maintained and serviced. Ten years ago, terminals were periodically overhauled. Today's improved manufacturing standards and advanced electronics have made the scheduling of major and lengthy maintenance obsolete. Terminals in use today require more preventive maintenance and vendor support.

To maintain terminals, companies must establish basic preventive maintenance procedures that can be easily executed by terminal operators.

Many vendors have reacted to this need by including service options as an integral part of their selling packages. Service organizations, which share the maintenance responsibilities with the operator, are also more prevalent.

To help maintain a network of terminals, companies must establish basic preventive maintenance procedures that can be easily executed by terminal operators. In addition, they must select an equipment service contract that will meet all maintenance contingencies.

The investment of time needed to become versed in the simple preventive maintenance procedures outlined here will pay significant dividends in the form of optimal performance and uptime. The first step to take is the proper installation of terminals and customer training for those who will use them. Most computer failures occur during the first 90 days after an installation, oftentimes because of users' unfamiliarity with the system. Computer terminals are increasingly complex, and customer training helps to prevent downtime.

During training, a good service technician will explain the procedures and precautions operators must take. A good operator will take the time to listen and ask questions.

Operator's manuals are a good source of information for users. When reading, users should pay close attention to key parameters, including bit/sec rate, parity and duplex. This information should be kept handy, as it can serve as a quick reference for the basic operation of the equipment. The information is particularly helpful if the terminals are part of a shared system.

No training program is complete without a mention of the habits that can jeopardize electronic equipment. Although terminals, printers and electronic typewriters should be kept clean, care should be taken. Standard commercial cleaners can be used on most equipment, but spills will short out the unit. Similarly, placing a coffee cup on top of a terminal is a risk. Spills are referred to as "abuse" in most maintenance agreements.

In addition to spills, dropped staples, paper clips and other desktop paraphernalia can also damage a keyboard by shorting the circuit cards beneath the keys. Symptoms of this abuse include repeating characters or sticky keys.

Excessive heat can also cause terminals and other electronic equipment to malfunction. For this reason, air vents in CRT terminals and printer covers should not be blocked. Blocked air vents can cause a terminal to overheat, increasing the chances of failure. For the same reason, a terminal should not be placed in direct sunlight.

Another factor that can play a part in a terminal's possible malfunction is the use of improper cabling and electrical outlets. Plugging terminals into ungrounded extension cords is dangerous. These ungrounded cords can cause imperceptible shorts and related problems such as glitches and garble.

Environmental conditions also affect the performance of terminals and printers. Humidity, smoke and dust can impede the smooth operation of the terminal. Micros are especially sensitive to these elements.

A capable service technician can easily pinpoint and correct many problems over the telephone. The key here is patience. If you must make a service call, explain the problem to the technician and let him ask questions. Questions such as "Did you plug in the system?" or "Have you flicked the 'on' switch?" may sound

See SERVICE SR/36

Aaron is a national field service manager for Data Access Systems, Inc., a Blackwood, N.J., distributor of terminals, personal computers and peripherals with service, leasing and supply capabilities.

Now. Zentec quality at a wise price.

Announcing Zentec's Zephyr™ Terminals.

Make a wise decision. Buy your terminals from a company that can give you reliability and DEC-compatibility at a great price.

Until now, Zentec terminals were only available to OEM's. This very picky group of buyers bought over a hundred thousand Zentec non-stop performers.

After eleven years of selling exclusively to the OEM market, we're "going public"—making rugged [illegible] available through distributors.

For the first time, you can get the same quality, full product support, on-time delivery and unbeatable prices from the CRT experts at Zentec.

More to Zephyrs than Meets the Eye.

Each Zephyr comes complete with a full set of emulation features, tilt and swivel display, a keyboard that fits your application, and designed-in reliability.

Zentec Zephyrs have everything you'd expect from a high-quality, DEC-compatible terminal. At a much better price.

	Zephyr DD52	Zephyr DD220
Emulates	VT52	VT220
Screen size	12"	14"
Columns	80	80 or 132
Programmable function keys	—	15
Soft set-up	yes	yes
Price	$490	$850

ZENTEC
OEM quality. Distributor Prices.

Computer security demands more than Bushido.

The legendary samurai warrior of feudal Japan represented the state-of-the-art in information security. And Bushido, which was his code of honor, placed duty above life itself.

But 20th century management demands something significantly more effective. It demands advanced technology and practical know-how.

The experts at Total Assets Protection have helped hundreds of corporations around the world maximize the security measures protecting their information assets—information that is critical to the continued profitability or existence of any business.

We can evaluate your company's information security vulnerabilities, recommend cost-effective solutions and develop an ongoing information security program. Additionally we can implement important technical and procedural countermeasures such as security software, cryptographic subsystems and security awareness training, to name but a few.

But information security is only part of the job Total Assets Protection can do for you. We're also an industry pioneer and the leader in physical security, designing and building secure computer centers, risk analysis and disaster recovery planning.

If the consulting firm or in-house staff specialist you're considering doesn't have our unique expertise, call us today.

The computer security specialists.

TOTAL ASSETS PROTECTION
• INCORPORATED •

500 BROOKHOLLOW ONE · 2301 E. LAMAR BOULEVARD
ARLINGTON, TEXAS 76006 · (817) 640-0020

Scholar praises electronic fellow

Vartanian uses his Total Talk terminal to prepare class work and to compose his personal correspondence.

SAN DIEGO — A blind scholar of American thought who teaches at San Diego State University here has great esteem for a colleague he calls "the fellow," even though this fellow speaks not with learned authority, but with a Swedish accent.

"The fellow" is one of two talking computer terminals that Pershing Vartanian uses to help him write correspondence, course outlines, exams, article drafts and manuscript summaries. Vartanian types information into the machines using a standard keyboard. The terminals then read back the information word by word, line by line or a screen at a time, depending on instructions Vartanian enters on the computer terminal's numeric keypad.

The machines, Total Talk terminals from Maryland Computer Services (MCS), are Hewlett-Packard Co. 125s fitted with speech synthesis boards, speech control panels and software that allows them to turn any group of characters into a spoken word. Vartanian uses one Total Talk machine at home as a standalone workstation and another at San Diego State as a terminal that accesses the school's three mainframes.

Vartanian said the terminals' ability to read back prose he has written allows him to regain the control over his writing that he enjoyed before he lost his sight. "The MCS equipment is a built-in pair of eyes that I can use for immediate response," he said.

Vartanian had prided himself on his scholarly writing, but could not carry it out alone after he went blind. "I had to rely on others to help me," he said. "For a writer like myself, it was an aggravating intrusion on a very personal experience."

Vartanian lost his sight through a degenerative disease called retinitis pigmentosa in 1958, when he was 26 years old. He had been working as a high school teacher and continued to teach for three years. Assistants helped him type class material, correct papers and perform tasks he was no longer able to handle alone.

During the summers, he studied toward a master's degree at Columbia University. As he composed his thesis for the degree, a treatise called "The Puritan Symbol in American Thought," his handicap intruded on his work.

"Most of the time I had to rely on an assistant," he said. When he worked alone, he left scrambled notes for his typist and hoped the typist could decipher what he had written. "It wasn't the most efficient or pleasant way to write a thesis, to say the least," he said.

In 1968, Vartanian began work as an assistant professor of history at San Diego State and was completing work on his Ph.D. in American history from the University of Michigan. He grew increasingly frustrated at his dependence on others for help in his scholarly pursuits.

In 1980, he began looking for a tool to help him regain independence. "By then I had been teaching at the college level for about 15 years and was more than ready for a talking computer," he said.

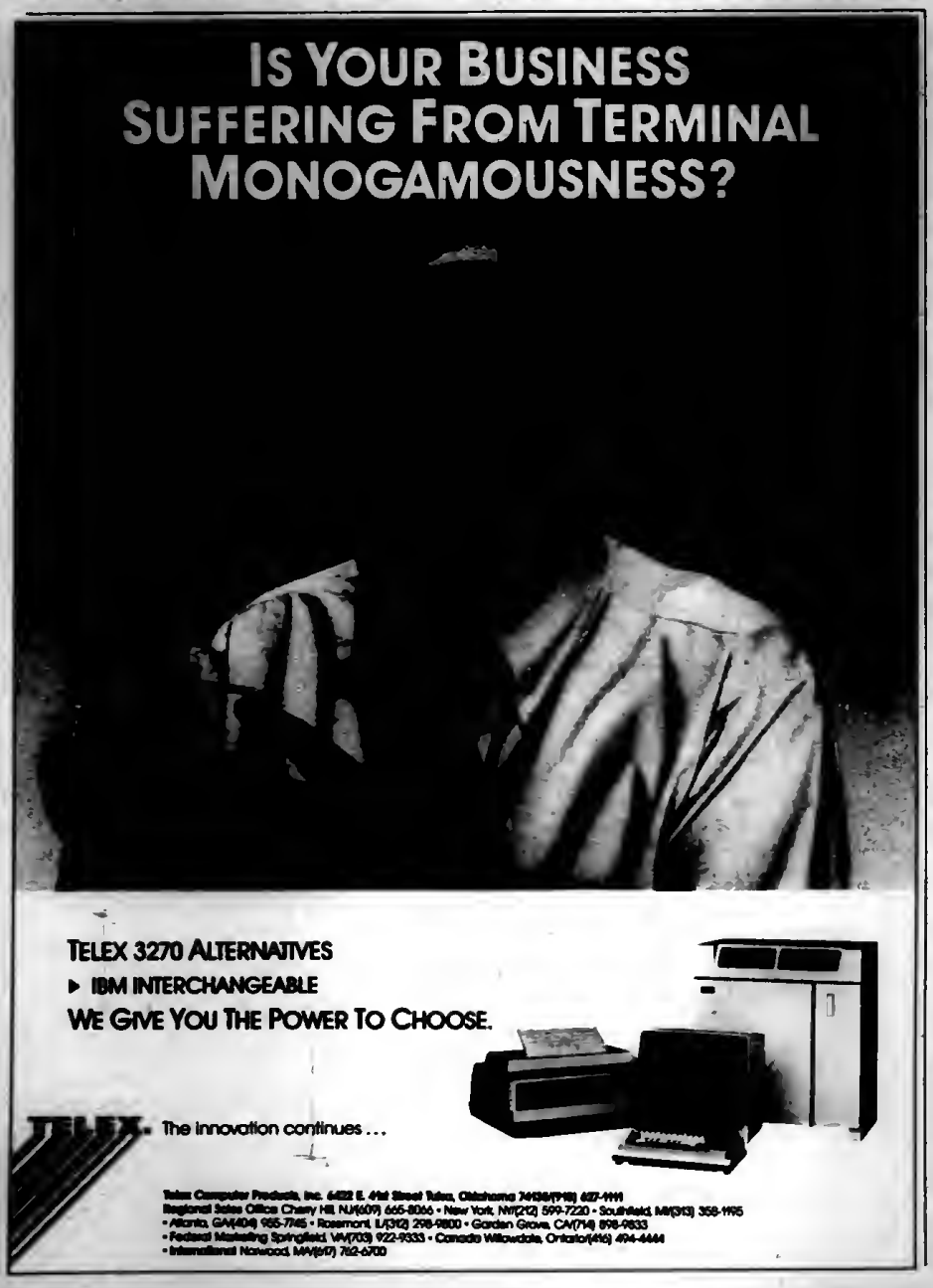
He called MCS' president and explained his needs. "I told him I wanted the machine to be able to spell a word on demand, to speak one word at a time, a line at a time and a page at a time," he said.

Vartanian said Total Talk met his specifications, and he purchased his first terminal shortly afterwards. He later traded that terminal for the one he now calls "the fellow," an upgraded version called Total Talk II, which he uses at home to perform about 80% of his work.

In his office at the university, Vartanian works on another Total Talk, which the school purchased for his use. The machine has access, via a modem, to the school's three mainframes, a Control Data Corp. Cyber 170/150, a Digital Equipment Corp. VAX-11/780 and a DEC PDP-11/45. The school has a second Total Talk in its handicapped student center.

Vartanian said that some blind people have difficulty adjusting to the machines because they have relied on braille and other tactile aids throughout their lives. "But for me," he added, "[the terminals] relieved a lot of frustration and anger that I had built up in regard to writing and independence."

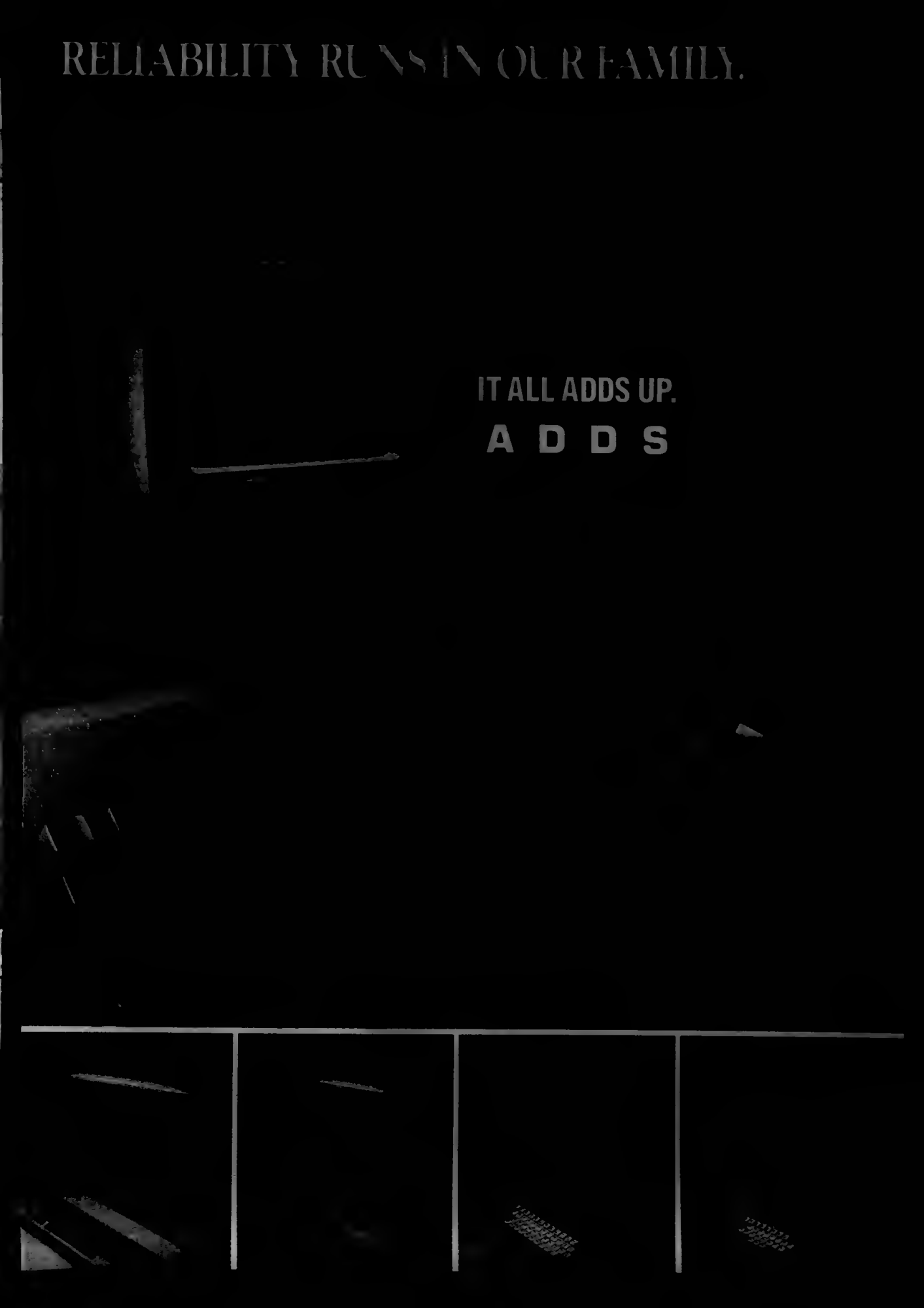
He is currently using the machines to help him compose a book that traces the trend toward specialization in American education and the reaction against that trend.



RELIABILITY RUNS IN OUR FAMILY.

IT ALL ADDS UP.

A D D S



SERVICE from SR/34

simplistic, but these points are sometimes easily overlooked. Data Access Systems, Inc.'s service division has found that 10% of their service calls are attributed to these oversights.

Prevent unnecessary service calls

To save the expense of unnecessary service visits, make sure terminal operators check with the systems operator before calling a service technician. Often what is perceived as an individual terminal problem can actually be an entire system failure or a temporary shutdown.

There are many forms of service contracts to satisfy different end-user needs. When considering the purchase of a service contract, ask the vendor or manufacturer these questions:

- Do they have their own service technicians?
- Do they offer a 90-day warranty, preferably on-site with complete vendor responsibility for problems during this period?
- What facilities does the manufacturer or vendor have?
- Does the service organization have a center for refurbishing circuit cards and terminals?
- Does it have a central dispatch toll-free number?
- Does it have national coverage with service centers in key metropolitan areas? Do the local centers offer walk-in service to avoid technician travel time and expense?

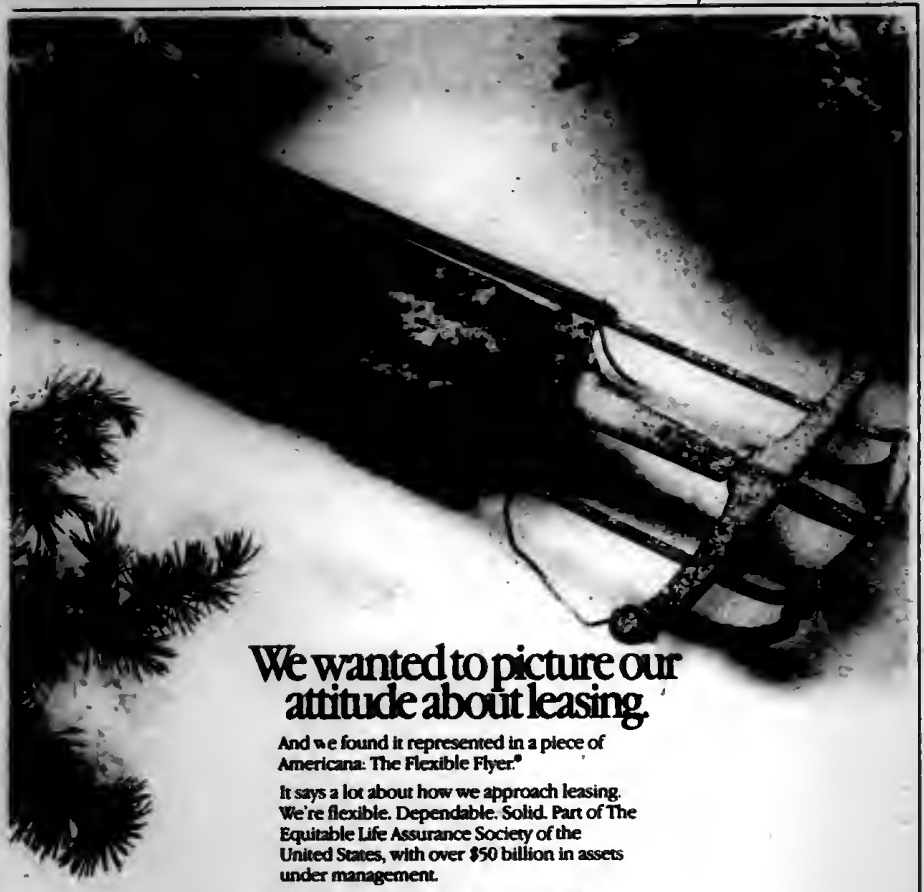
Service agreements are available in the following forms:

- Maintenance contract. This type of policy provides one-year, on-site maintenance; the prepaid fee is typically based upon the price of the unit.
- Return-to-depot contract. This contract is considerably less expensive than the maintenance contract because repair work is done at a service center. While the unit is in for repair, better service vendors do light, preventive maintenance such as clean the keyboard.
- Time and material. Some computer terminal owners are willing to risk having no service coverage; when a unit fails, they call for on-site service and pay a portal-to-portal rate on an hourly basis as well as the price of a part, if a new part is indicated. An alternative would be to deliver a failing unit to a service center; the charge is based on actual time and material necessary to repair the unit with no travel time charges.
- In-house servicing. Some companies find it cost-effective to establish internal service capabilities. These are typically large companies with a great number of computer terminals. Today's simpler and smaller units require no more effort than to replace a defective board with a new board at an exchange rate.

A careful analysis of the capabilities and services offered by a manufacturer or vendor is well worth the effort. At the very least, a service organization should have appropriate and ample facilities manned by capable service technicians. A 90-day warranty, preferably for on-site service with the vendor assuming complete responsibility for problems during this period, might be considered standard.

The ideal service package will also include a center for refurbishing circuit cards and terminals, a central dispatch toll-free number and national coverage with service centers in key metropolitan areas that offer walk-in services.

If your vendor or manufacturer offers most or all of these capabilities and services, and your operators develop a habit of preventive maintenance, you can be assured that your computer terminals will provide the performance they were designed to give.



We wanted to picture our attitude about leasing.

And we found it represented in a piece of Americana: The Flexible Flyer.®

It says a lot about how we approach leasing. We're flexible. Dependable. Solid. Part of The Equitable Life Assurance Society of the United States, with over $50 billion in assets under management.

You'll get quick, customized service. We know that everyone has special needs. We act responsibly and responsively.

Like the Flexible Flyer, we do our best to smooth out the bumps.

So when you want to lease state-of-the-art technology from a state-of-the-art leasing company, just call 1-800-854-1074 from 9-5 Pacific time any weekday. (From California, call 619-458-4400.) Our operators will notify our nearest office to contact you. And we'll eliminate the tough sledding.

EQUITABLE LIFE LEASING CORPORATION
10251 Vista Sorrento Parkway, Suite 300, San Diego, CA 92121
Flexible Flyer® is a trademark of Huffy Flexible Flyer Inc. Used with permission.

HEALTH from SR/33

the system. Some open office panel systems are internally wired, bringing electrical outlets to the actual work surface. By internally routing computer wires and cables, lines running down the exterior of the panel, as well as tombstones (floor-mounted electrical outlets that limit rearrangment of the office layout) are eliminated.

Flat wiring

Flat wiring is an inexpensive and concealable means of managing the various wires and cables needed in an automated, conventional office environment — one furnished with stand-alone desks. Here, flat wires are run along the floor, under the carpet, to deliver electrical support where needed. These wires are rerouted by taking up the carpet. Many offices now use removable carpet tiles, which makes rerouting, if needed, easier.

Although focusing on the physical characteristics of the office will undoubtably improve its ergonomic fitness, the most reliable method of determining if your staff is comfortable in the automated office is to ask them. Find out if glare is a problem. Ask if desks and tables are appropriately fitted, and try alternatives if necessary. If possible, arrange for a prepurchase trial period to test the computer equipment under consideration.

The National Office Products Association 1983 survey on "The Future of the Office Furniture Industry" reported that personnel expenses now account for approximately 40% of the total cost of doing business. Expenditures for furniture and equipment consumed only an estimated 1% of the total.

It is essential, therefore, that personnel are comfortable with office automation and that investments in computer upgrades do not drive away valued employees. While the computer vendor will have a replacement on the shelf, the available labor pool may not be so bountiful.

IBM PC Workstation $1595.00

Santa Clara Systems makes your investment in the IBM PC, PC XT or PC AT look even better.
Now, everyone in the office can afford to have an IBM PC at their fingertips. Without buying additional computers, and for a fraction of their cost. Only $1595.

The Santa Clara Systems PCterminal, complete with keyboard and monitor, easily connects to any existing PC, PC XT or PC AT allowing you to share the data and resources you already have on hand —hard disk drives, printers, graphic plotters and the like.

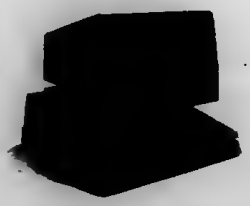
Built-in local area networking makes it possible.

PCterminal won't limit your existing PC's performance either. Because it has its own 8088 microprocessor and 64 KB of random access memory, expandable to 256K.

Very intelligent indeed.

But that's not all. Built-in parallel and serial ports, along with four expansion slots enable you to add a host of peripherals, as well as additional memory, graphics cards and other productivity enhancers.

The Santa Clara Systems $1595 PCterminal. A small price to pay for a big gain in productivity.
You won't find a better value anywhere. Your local Santa Clara Systems distributor can prove it. Call and order yours today.



Santa Clara Systems, Inc.
1860 Hartog Dr., San Jose, CA 95131
(408) 287-4640/Telex: 176309 SCS SNJ

Registered Trademarks: IBM, IBM Corporation; Intel, Intel Corporation; PCterminal, Santa Clara Systems.

DATA ENGINEERING SALES, INC.
375 Main St.
Stoneham, MA 02180
617-438-4700

CAJ SYSTEMS, INC.
3 Neshaminy Interplex, Ste 301
Trevose, PA 19047
215-638-8222

AMERICAN MICRO DISTRIBUTORS, INC.
3030 Powers Ferry Rd., Ste 217
Atlanta, GA 30339
404-951-8964

MICROLINES
1134 SW Fifth Ave.
Portland, OR 97204
503-224-3800

ADVANCE DATA PRODUCTS, INC.
10976 Bustown Way
Gaithersburg, MD 20879
301-424-0490

KALTRONICS DISTRIBUTING INC.
702 Landwehr Road
Northbrook, IL 60062
312-291-1220

KALTRONICS DISTRIBUTING INC.
10880 Switzer Rd., Ste 105
Dallas, TX 75238
214-348-1022

COMTEC
534 Salem Ave. SW
Roanoke, VA 24016
703-981-0326

KALTRONICS DISTRIBUTING INC.
833 West Main St.
Carmel, IN 46032
317-848-8001

FERRARI COMPUTER SERVICES, INC.
1800 Howard Ave. Ste 206
Vienna, VA 22180
703-821-3080

COSTA DISTRIBUTING, WEST
551 San Mateo Ave.
San Bruno, CA 94066
415-952-6113

COMPUSERVE
1675 West Eighth Ave., Ste 219
Vancouver, B.C., Canada BC V6J 1F2
604-733-7783

COMPUSERVE
666 Bond Rd.
Markham, ON, Canada L3R 3K9
416-477-0008

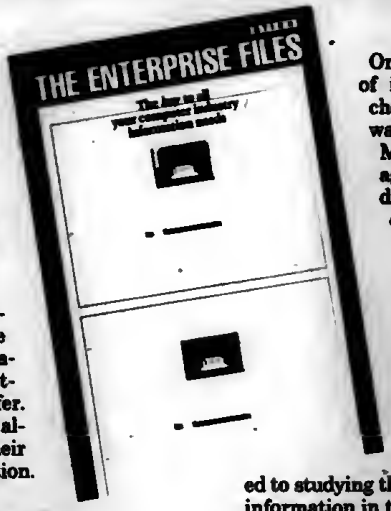
COMPUSERVE
3450 Drummond St., Ste 2
Montreal, PQ., Canada H3G 1Y2
514-844-8043

Send for this FREE brochure and find out why the Enterprise Files may be your most important marketing tool

The Enterprise Files from International Data Corporation give you the detailed sales information you need to stay ahead in today's competitive computer market.

Now you can locate prospective clients, fine-tune your promotional campaigns, and track competing companies. And you'll do it all quickly, easily, and accurately.

When you subscribe to the Enterprise Files you'll get up-to-date facts on more than 13,000 companies and the 35,000 computer-related products & services they offer. Many leading organizations have already made the Enterprise Files their number one source of information. Here are four reasons why...



1) Comprehensive listings

The Enterprise Files are divided into two general categories, Vendor Files and Product Files.

Each vendor profile includes: company and division names, parent company, address and telephone number, type of company, number of employees, years in business, target industries, target applications, key corporate executives, geographic coverage, and product/service offerings.

Every product profile includes: price, model number, date of introduction, the number of installations, channels of distribution, and market status. Also, each product or service is researched individually, with up to 25 product-specific characteristics identified.

You'll get everything you need to compare product specs and contact vendors.

2) Custom packaging

No matter which companies and products interest your organization, you can get the information you need, the way you need it. Because the Enterprise Files are available in three ways. You can choose the complete file, any of 26 standard subfiles, or custom packaging. So you'll pay only for what you need.

3) Easy to use

Once you've determined what kind of information you need, you can choose between three convenient ways of receiving your information. Magnetic tape for permanent storage, pressure sensitive labels for direct mail promotions, and hard copy for a handy resource tool.

4) Accurate listings

The information in the Enterprise Files is gathered and updated daily by International Data Corporation. IDC has been the leading market research firm covering the information processing industry for 20 years. And IDC is the only firm solely dedicated to studying this market. So you can rely on the information in the listings.

Send for your FREE brochure today

Can you afford to be without this kind of detailed information about your industry? Put the Enterprise Files to work for you. Call Mike Hovagimian today to get your FREE copy of our brochure. It describes what the Enterprise Files are, what your custom packaging options are, and includes a rate sheet. Call right now. You can reach Mike at (617) 872-8200.

Or, if you prefer, fill out the coupon below and return it today.

☐ Yes, I want to get all the latest market information. Rush me a FREE copy of your brochure today so I can see how the Enterprise Files can help me.

Name _____
Title _____
Company _____
Address _____
City _____
State _____ Zip _____ Phone _____

Return to:
Mike Hovagimian, International Data Corp.,
5 Speen Street, Framingham, MA 01701

IDC
INTERNATIONAL DATA CORPORATION

SOFTWARE & SERVICES

Utility's DBMS overhaul keys DP modernization

POUGHKEEPSIE, N.Y. — Entering the 1980s, Central Hudson Gas & Electric Corp., an investor-owned utility here, was having increasing difficulty providing rapid, accurate response and service both to its 285,000 customers and to its internal corporate users.

Faced with a small DP staff, more than 80% of whom had less than one year's experience; a corporate five-year plan for new systems development; 20-year-old tape systems; development lead times extending beyond reason and acceptability; and increasing demands for improved customer service by regulatory agencies, it was clear to Robert Berger, director of electronic data processing at Central Hudson, that a new approach was needed. After just three years of effort, Central Hudson's DP staff solved those problems and created in the process what it believed to be one of the most complete, flexible and responsive customer information systems in the utility industry.

At the root of Central Hudson's problems was its reliance on batch autocoder systems developed in the 1960s to process the core of the utility's customer, financial and plant accounting data. Remedies to provide on-line query to files refreshed nightly were straining under a daily load of more than 1,800 service-related calls as well as 20,000 billing, payment and main-

See REMEDY page 71

SOFTLINE
Scott A. Kuklin

Phase systems in gradually

Businesses are spending billions of dollars each year to implement information resource management systems. Due to their size and complex nature, these systems commonly take from five to 10 years to implement. But with a strategy in which systems are phased in gradually, the organization can have usable systems within 12 to 18 months.

The possible ramifications of improper implementation decisions on projects of this magnitude can include a doubling or tripling of the original budget, not to mention the chaos and disruption an improper decision can cause within an organization.

This article presents some critical success factors related to the phasing-in of major information management projects, which corporate MIS managers should bear in mind. Before any business decision can be made, it is necessary to gather a minimum of information, including an understanding of how the existing system functions, how the proposed system will function, the data model required to support the proposed system and the effect the proposed system will have on the organization.

Any implementation decisions made without this minimum knowledge could have catastrophic effects on the organization. Once this information is gathered, there are also organizational, cultural and technological critical factors that must be addressed.

Every system, large or small, must be

See PHASING page 76

Kuklin is executive vice-president of Helix Corp., located in Westlake Village, Calif.

SOFTALK
Paul Gillin
CW Senior Editor

Users group boom: Food for thought

Users groups are taking off. Based on observations from attendance at eight of them this year, it appears this concept of getting together to meet your fellow users is more popular than ever. Many users groups are seeing attendance double each year. And with their new popularity, planning has become more critical than ever.

The following, in no particular order, are some of the issues that arise most frequently:

■ Should your group be independent or vendor-sponsored? This is the most critical decision the users can make. Groups that the vendor pays for are

See GROUP page 75

Integration tops SI plans

GE software division plans several releases

By Paul Gillin
CW Staff

SAN DIEGO — GE Software International Corp. (SI), which has suffered from charges of poor integration and documentation of its application software packages, is planning major new releases of virtually all of its products next year with a new focus on common functions and ease of use.

Speaking at the 15th Software International Users Group held here recently, Robert Tatum, vice-president of technology at Software International, said the integration will focus on seven areas: Smart Link, Software International's microcomputer-mainframe link; common screens and transaction processing; security; Help messages; navigator aids; queries; and doc-

See SI page 76

■ Software Research Corp. has introduced a package said to interface a variety of QA systems with IBM's Distributed Office Support System/64

■ Digital Equipment Corp. beefs up its VAX VTX videotex software/66

■ Database Utility Group unveiled a new version of its [Software AG of North America, Inc.] Adabas Performance Analysis System/66

■ Index Technology Corp. announced that IBM will market its Excellerator information systems development tool/67

■ Pansophic Systems, Inc. announced enhancements to its Gener/OI application generation system/67

INSIDE

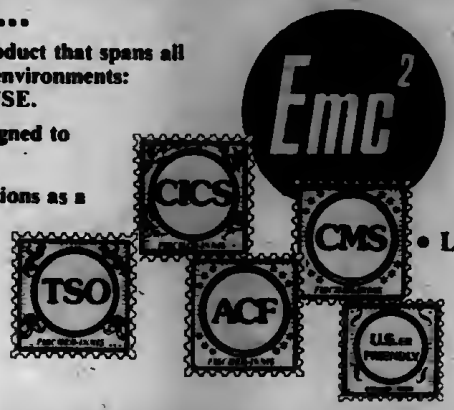
Systems Software/64
Productivity Aids/66
Application Packages/67

ELECTRONIC MAIL COMMUNICATION CENTER
Lightyears Ahead...

The ONE electronic mail product that spans all three major IBM ope. ting environments: VM/CMS • MVS • DOS/VSE.

Emc2 is easy to use. It's designed to get the mail moving *fast*.

In addition, Emc2 now functions as a super-efficient ACF/VTAM application. This allows literally thousands of people in your company to use mail, without needing TSO, CICS or CMS user IDs!



• Full-screen menus and help panels
• Scrollable inbaskets and outbaskets
• Uncomplicated text entry
• Mailing lists • Bulletin boards
• Calendar features
• Efficient data base storage
• Simple installation
• Low administrative overhead

CALL TODAY FOR MORE INFORMATION, OR TO SET UP A FREE TRIAL: 800-237-4510
In Florida, call 813-793-1500

FISCHER INNIS SYSTEMS CORPORATION
4175 MERCHANTILE AVENUE • NAPLES, FLORIDA 33942

Copyright © 1984 by Fischer-Innis Systems Corporation
Electronic Mail Communication Center and Emc2 are trademarks of Fischer-Innis Systems Corporation

IBM Disoss interface out

NATICK, Mass. — Software Research Corp. has introduced an IBM Distributed Office Support System (Disoss) interface software package intended for use with non-IBM office automation equipment and IBM's Disoss document library and distribution software.

Residing on an IBM host mainframe, Docupower is implemented in IBM's CICS/VS operating environment, the vendor said.

Supporting IBM Systems Network Architecture and binary synchronous protocols, Docupower enables users to format an IBM Document Interchange Architecture command from a non-IBM OA product and allow it to be interpreted by Disoss, according to the vendor.

Information dispersal

As a result, information reportedly can be disseminated to all office automation equipment linked via a network — including systems from Honeywell Information Systems, Inc., Lanier Business Products, Inc. and Wang Laboratories, Inc.

The price of Docupower is $15,000 for the first copy and $5,000 for subsequent copies.

For further information, Software Research is headquartered at One Natick Executive Park, Natick, Mass. 01760.

VisiCorp

has sold Communications Solutions, Inc. to

Control Data Software Company

a division of

Control Data Corporation

The undersigned initiated this transaction and assisted VisiCorp in the negotiations.

Alex. Brown & Sons
Incorporated

November 21, 1984

SYSTEMS SOFTWARE

KISCO INFORMATION SYSTEMS
F1 Manager

Kisco Information Systems has announced F1 Manager, a disk space management package for the IBM System/36 minicomputer running under IBM's SSP operating system.

According to a spokesman, the F1 Manager spotlights inefficient disk uses and searches out poor file and library placements. It also analyzes changes in disk usage. A time analysis feature forecasts when the next disk upgrade may be required, up to three years in the future.

F1 Manager is said to leave a descriptive record of all files and libraries located on a System/36 fixed disk. When disk upgrades are installed, the package recognizes them automatically and readjusts output reports to show the expanded disk resource.

A one-time license fee is $250.

Kisco Information Systems, 120 Beverly Road, Mount Kisco, N.Y. 10549.

GRANADA SYSTEMS DESIGN, INC.
PC/Sail

Granada Systems Design, Inc. has announced an interactive IBM Personal Computer communications hardware and software product that permits communications between asynchronous devices — such as cash registers, audio response units and optical character recognition/bar code wands — and an IBM System/34, System/36 or System/38 minicomputer in a real-time, on-line mode. The communications link from the IBM Personal Computer to the IBM minicomputer is via a native IBM 4251/12 protocol.

According to a spokesman, the PC/Sail system provides the necessary intelligence and multitasking required to read data from an asynchronous device, transmit the data to the host minicomputer in real-time and, at the same time, translate the asynchronous protocol to a standard IBM 5251/12 synchronous protocol.

The package includes a Synchronous Data Link Control board, an asynchronous communications board and a diskette with the software. It is priced at $1,600.

Granada Systems Design, 303 Fifth Ave., New York, N.Y. 10016.

COMPUWARE CORP.
DOS/CICS Abend-AID

Compuware Corp. has introduced a version of its Abend-AID for IBM's 4321 or above processors and compatibles running under IBM's DOS/CICS environment.

According to a spokesman, DOS/CICS Abend-AID provides on-line access to English diagnostics explaining the cause of system abends, as well as a solution to the problem. CICS data is formatted so that no hexadecimal calculations or address chaining are required. The output is written to DOS/CICS Abend-AID's self-maintained data set. All file areas are formatted by record, and file input and output statistics are provided. The system's trace table contains only those entries associated with the abending task.

The price of DOS/CICS Abend-AID ranges from $4,800 to $7,500, depending upon the computer.

Compuware, 32100 Telegraph Road, Birmingham, Mich. 48010.

PROGRAM ACCOUNTABILITY & EVALUATION, INC.
Timer/38

Program Accountability & Evaluation, Inc. has announced a job scheduling system for the IBM System/38 running under IBM's CPF 2.0 operating system.

According to a spokesman, Timer/38 controls System/38 installations around the clock and submits jobs from powering up or down to reorganizing files.

The price of Timer/38 is $500.

Program Accountability & Evaluation, Seven Riverway Road, Salem, Mass. 01970.

AK, INC.
Trace

AK, Inc. has announced a program debugger that operates on IBM processors under IBM's MVS, MVS/TSO or VM/CMS operating systems.

According to a spokesman, the Trace debugger prints the results of the execution of machine language instructions of the traced program as they are being executed. It reportedly prints in a fixed format, including information on condition code, whether a branch was taken, contents of involved registers and contents of storage areas referenced by the instruction.

The price of the Trace program debugger is $2,500.

AK, 1671 McBain Ave., San Jose, Calif. 95125.

MICHAELS, ROSS & COLE LTD.
MRC-Maintainer 4.0

Michaels, Ross & Cole Ltd. has announced enhancements to its MRC-Maintainer application generator for the IBM System/38 minicomputer.

Designed for nontechnical users, the product reportedly provides fourth-generation language capabili-

Continued on page 68

CCA EMACS. THE MOST POWERFUL SCREEN EDITOR FOR UNIX AND VAX/VMS.

No other text editor gives you so much power, speed, and functionality as CCA EMACS.™ Or makes editing so easy. Close to 400 built-in commands let you do any task with only a few keystrokes. Even things that are impossible on other editors. And with our Common Lisp based extension language, Elisp,™ you can customize CCA EMACS to meet your program requirements.

Multiple windows are another important plus. So you can manage concurrent processes and move information from one window to another. And CCA EMACS is supported by a full online documentation package that includes a novice tutorial. So any user can quickly utilize all the power of CCA EMACS.

CCA EMACS runs on Berkeley Unix™ (4.1BSD and 4.2BSD), Bell Unix (System III and System V), and VAX/VMS.™

Prices for a binary license range from $350 to $1900.

For more information, or to find out how to get a trial copy, call Gwendolyn Whittaker at (617) 492-8868.

Unix is a trademark of Bell Laboratories.
VAX and VMS are trademarks of Digital Equipment Corporation.
CCA EMACS and Elisp are trademarks of CCA Uniworks, Inc.

CCA Uniworks, Inc.
A Crowntek Company
Four Cambridge Center, Cambridge, MA 02142

SOFTWARE & SERVICES

Continued from page 64

tion to the System/38, according to the vendor.

MRC-Maintainer features on-line help, multifile backup and edit capabilities, an audit trail, field editing and message file interface, according to the vendor. The program is said to work with existing System/38 data bases.

MRC-Maintainer costs $1,140 per CPU.

Michaels, Rose & Cole, P.O. Box 4532, Oak Brook, Ill. 60521.

DIGITAL EQUIPMENT CORP.
VAX VTX Videotex Software Version 1.1

Digital Equipment Corp. has announced a version of its VAX VTX videotex software that adds support for British Telecom's Prestel (Level 1) terminals and Ansi North American Presentation-Level Protocol Syntax (NAPLPS) graphics display protocols on DEC's Professional 350 workstation running PBO/NAPLPS, Sony Corp.'s VDX-1000 videotex unit and Norpak Corp.'s Mark IV videotex decoder, as well as DEC's Dectalk text-to-speech terminal.

VAX VTX videotex subscribers also can use the IBM Personal Computer as a videotex terminal using Microstuf, Inc.'s Crosstalk XVI Ascii/VT100 emulation package. VAX VTX runs under both DEC's VMS and Micro VMS operating systems and supports all of DEC's VT100 and VT200-compatible terminals.

VAX VTX Version 1.1 videotex is a multiuser, layered software product that provides distributed videotex services in a business environment.

The price of a full license for the VAX VTX Version 1.1 is $25,000, and it will be available in December 1984.

DEC, Maynard, Mass. 01754.

SYNAPSE COMPUTER CORP.
Synapse Program Generator

Synapse Computer Corp. has announced the Synapse Program Generator which works with the company's N+1 On-Line Transaction Processing System.

The product accelerates the development of Cobol transaction application programs and screen forms, according to the vendor. Synapse Program Generator is nonprocedural and only requires that the programmer answer screen prompts, the vendor said.

With the product, a user reportedly can create interactive programs that read, write and update relational data base rows; batch programs that process large numbers of data base rows; programs that create listings of selected portions of a data base; and file-transfer programs that move data from other systems to a Synapse system.

The Synapse Program Generator is priced at $7,500.

Synapse Computer, 801 Buckeye Court, Milpitas, Calif. 95035.

PRODUCTIVITY AIDS

OXFORD SOFTWARE CORP.
UFO/Cobol 1.1

Oxford Software Corp., has announced that its UFO/Cobol application generator will now work in an IBM VM/CMS operating environment.

UFO/Cobol 1.1 is said to allow the UFO Cobol programmer to develop IBM CICS applications in the VM/CMS operating environment. The new release reportedly allows the user to transfer control of UFO/Cobol programs to other CICS programs and allows a CICS programmer to communicate with UFO/Cobol programs.

A new clause allows the cursor to be positioned by field name in the program, the company said. With the enhancement, the program reportedly can do a compile from multiple libraries.

Cost of the program under IBM's CMS and DOS operating system is $24,000. Cost for IBM's OS operating system is $33,000, according to Oxford Software.

Oxford Software, 174 Boulevard, Hasbrouck Heights, N.J. 07064.

DATABASE UTILITY GROUP
Adabas Performance Analysis System 2.0

Database Utility Group has announced enhancements to its Adabas Performance Analysis System (Apas) which runs under IBM's MVS and DOS operating systems.

The product works with Software AG of North America, Inc.'s Adabas data base management system. Enhancements include fields for summarizing descriptor and field usage, user-defined fields and nucleus statistics fields for interactive display and interval reporting.

Apas reportedly features a histogram output format, an improved history system, the ability to selectively copy fields and improved recovery and operating system interfaces. Apas is priced at $8,750.

Database Utility Group, P.O. Box 4072, Federal Way, Wash. 98002.

SOFT WEAR MANAGEMENT, INC.
Service/38

Soft Wear Management, Inc. has introduced a documentation and object management program for use on the IBM System/38.

According to the company, Service/38 has more than 50 commands organized into four modules, each with its own user reference manual, providing both on-line and hard copy.

The four modules, Object Analysis, Object Management, Text Writer and Report DOC, sell for $1,275.

Soft Wear Management, 11181 Greenhurst Drive, Riverside, Calif., 92505.

Before RM/
PC-to mainfra
communicatio
had advance
about mi

Software & Services

PARAGON SYSTEMS, INC.
Version 3.5 Gener/OL

Paragon Systems, Inc. has announced an enhanced version of its Gener/OL fourth-generation language for interactive, on-line program development. Gener/OL is designed for use with IBM's 360, 370 and 4300 series and compatible computers under IBM's DOS or OS operating systems with CICS 1.5 and higher.

According to a spokesman, Gener/OL 3.5 is said to support the blending of applications written in Gener/OL with applications written in CICS Command Level, cross-referencing of maps and programs and full support of temporary storage. Additional features include a handle condition to intercept the clear key and a security system which allows multiple users to log on to a single user identification.

The enhanced version of Gener/OL is available at no cost to domestic Gener/OL users under current maintenance agreements. Price of Gener/OL 3.5 for DOS is $35,000 and for OS is $40,000.

Paragon Systems, 700 Enterprise Drive, Oak Brook, Ill. 60521.

INDEX TECHNOLOGY CORP.
Marketing contract with IBM

Index Technology Corp. (Intech) has announced that it has entered into a contract with IBM, through which IBM will market Intech's Excelerator system for the IBM 3270 Personal Computer.

Excelerator provides facilities for analyzing, designing and documenting information systems on the 3270-PC. It allows users to develop and revise data flow diagrams, structure charts, data model diagrams and other components of a system specification document.

Excelerator's menus-driven graphics capabilities allow users to create diagrams, and the system's presentation graphics provide for the production of documents for client or management review. In the graphics mode, the system can draw icons representing terminals, floppy disks and people.

The spokesman said all information about system design is stored and integrated through the product's data dictionary. The dictionary includes descriptions of programs and processes, data elements, data records and files. Excelerator reportedly can also transfer data to and from the 3270-PC and a mainframe or other workstations on a local-area network. Through the product, an analyst can develop an integrated system specification document, including report layouts, screen definitions and record and file layouts.

Excelerator software is priced at $8,500.

Intech, 5 Cambridge Center, Cambridge, Mass. 02142.

SOFTWARE CONNECTION, INC.
Kwic-File

The Software Connection, Inc. has developed a text indexing and search productivity aid called Kwic-File for use with Wang Laboratories, Inc.'s VS line of computer systems.

Kwic-File is said to allow users to enter certain words or phrases and retrieve all documents in the system that contain those words or phrases. The system is recommended for litigation support, as well as a bill tracking, research, credit and property records maintenance.

The price of Kwic-File is $5,000.

Software Connection, Suite 300, 5455 S. Yosemite St., Englewood, Colo. 80111.

APPLICATION PACKAGES

MCBA
Dibol Release 7

MCBA has announced that its Dibol accounting and distribution software is now available for Digital Equipment Corp.'s VAX-11 computers.

According to the company, the nine software packages that make up Release 7 of Dibol are modular, integrated systems. The package consists of accounts payable, accounts receivable, bill of materials processor, customer order processing, fixed assets and depreciation, general ledger, inventory management, payroll and purchase order and receiving.

Prices range from $900 to $4,500, depending on the hardware model.

MCBA, 9441 Honolulu Ave., Montrose, Calif. 91020.

SOFTWARE INTERNATIONAL CORP.
Fixed Assets Management enhancement

Software International Corp., has announced an on-line version of its Fixed Assets Management software package.

The new version runs under IBM's OS and DOS operating systems and is said to feature real-time edit and update of the Asset Master File. It reportedly allows users to add records to the file, update records already in the master file and inquire on the field. According to the company, an on-line Help facility is provided with the system.

The company's Fixed Assets Management System is a book and tax system that reportedly helps accounting, finance and tax personnel fulfill internal and external asset accounting, property control, tax accounting and information control requirements. It includes a multicorporation, multicompany structure, asset accounting, property and locations control, depreciation projection, tax control and insurance valuation.

Continued on page 69

Until just two years ago, communications between big IBM® mainframes and individual PCs was all smoke, without a bit of substance.

But two years ago, the smoke lifted.

With IRMA™, for the first time, PC users could extract needed information from the mainframe without going through MIS unnecessarily. All at once middle and upper management had a way to get timely information to make better decisions. But as revolutionary as IRMA was, it was far from the total answer.

The truth is, neither were our next two products. But we were getting closer. IRMAline™ and IRMAlette™ gave remote PCs the opportunity to communicate with the mainframes with the same ease as a local PC equipped with IRMA.

Because they were IRMA family products, all the software written for IRMA was compatible with IRMAline and IRMAlette.

As we developed each new product to meet a business need, we saw more opportunities in the marketplace. And we responded to them.

With IRMAcom™, an IBM 3274, 3276 controller emulator. With IRMAprint™, an IBM 3287 emulator. With IRMAlink DBX/CICS™ an MIS-controlled data file transfer system. And with IRMAkey,™ a keyboard that has every one of the functions of both an IBM terminal and PC.

For additional information about IRMA or any of the IRMA family of IBM-emulation products, send in the coupon below. Or call 1-800-241-IRMA. Telex 261375 DCAATL.

Mail to DCA, 303 Technology Park, Norcross, GA 30092. And we'll tell you more about all IRMA products.

Name _____

Firm _____ Title _____

Address _____

City _____ State _____ Zip _____

Phone _____

dcai

MP-03-07

SOFTWARE & SERVICES

Continued from page 67

The on-line Fixed Assets Management system is $45,600 for DOS and $47,700 for the OS. It is scheduled for delivery in February.

Software International, 1 Tech Drive, Andover, Mass. 01810.

SPERRY CORP.
Airline Revenue Enhancement Package

Sperry Corp. has announced a market analysis system for airline marketing and reservations departments.

According to the company, the Airline Revenue Enhancement Package enables airline management to extract summary inventory data from the on-line passenger service system and analyze the data using Sperry's Mapper programming language and color graphics.

The package works with either an IBM Passenger Airline Reservation System/International Passenger Airline Reservation System or a Sperry passenger reservation system running on Sperry 1100 series mainframes.

Input for all functions is done through menu selection, fill-in-the-blank screens or expert mode. The data is analyzed using predefined Mapper 1100 functions and Mapper color graphics. A series of standard functions, exception reports and situational reports are then produced, the company said.

Cost of the package is $125,000 for the Sperry Series 1100/60 and 1100/70 configurations and $137,500 for Series 1100/80 and 1100/90 configurations.

Sperry, Information Systems Group, P.O. Box 500, Blue Bell, Pa. 19424.

CENTURION COMPUTER CORP.
Service Industry System

Centurion Computer Corp. has introduced an integrated, multiuser, multitasking automation system for service contracting businesses using Centurion Series 6000 and Series 7000 minicomputers.

According to the company, the Service Industry System automates a variety of activities in service contract maintenance, including service contract preventive maintenance, service dispatch, labor and parts allocation, inventory, vehicle maintenance, job costing, accounts receivable, invoicing, mechanic time accounting, payroll, accounts payable, general ledger and financial statements.

A complete audit trail is maintained by the system on original estimates, change orders, purchases and final costs, the company said. Reports on job status, job cost, vendor invoices and weekly labor assignments are also produced by the system, the vendor said.

Service procedures are assigned standardized codes. Business not under contract is billed the same day, with a description of the performed service printed on the invoice.

Base price of the system is $12,500 and can range up to $18,000, depending on software modifications.

Centurion Computer, 111 S. Sherman, Richardson, Texas 75081.

WESTMORELAND SYSTEMS, INC.
Bar Graph Utility enhancement

Westmoreland Systems, Inc. has announced enhancements to its Bar Graph Utility for the IBM System/34 and System/36 that allow the user to set up bar graphs for display on terminals and that format the graphs for printing.

The Bar Graph Utility interfaces with the company's Calc 34/36 financial modeling system and Applications Design and Development System. Cost of the Bar Graph Utility is $300.

Westmoreland Systems, Suite 1, 226 Park Ave. N., Winter Park, Fla. 32790.

NBI, INC.
Juris-NBI

NBI, Inc. has announced an automated legal billing system for the company's 4100 series microcomputer and its clustered Onyx 2000 Personal Computing Work Station linked to an Onyx 64 central controller.

Juris-NBI reportedly provides up to 99 user-defined bill formats; four personnel-type codes; five types of billing agreements including flat-fee, standard rate, contingency, agreed and no-charge, as well as time codes, expense codes and practice class codes.

According to the company, the system allows direct ac-

Although our HERMES 615 multi-mode printer comes in a plain black and white casing it prints text and graphics beautifully in 8 colors.

Printing and graphics in 8 colors are just two of the numerous outstanding features of the HERMES 615. Professionals who only pick the best will also appreciate:

Its speed. Bi-directional, shortest path printing. 400/480 cps Data, 100/120 cps Near Letter Quality (single pass).

Its resolution. Finest print quality available on a matrix printer. So good you can even print signatures. Bit mapped graphics in single and double density modes, 8 dot densities in each mode. A circle on the screen means a circle on the paper too!

Its quality. Swiss high quality construction. Quality that lasts – thanks to its exclusive «moving-ruby» head.

Its versatility. Wide range of attractive character sets in 16 national versions, as well as math symbols, bar codes and Teletex. Dual ports, parallel (Centronics™/Epson™ compatible) and serial (RS-232C/RS-422) interfaces. DIABLO™ 630 emulation optional.

HERMES®
The impressive printers

Manufactured in Switzerland by HERMES PRECISA INTERNATIONAL, CH-1401 Yverdon.

HERMES printers are distributed in Austria, Canada, Cyprus, Finland, France, Greece, Jordan, Kuwait, Lebanon, Saudi Arabia, South Africa, Spain, Sweden, Switzerland, United Kingdom, USA, West Germany.

To receive a sample of the finest quality matrix print-out and additional information on the HERMES 615 please return the coupon below.

I want to know more about your printers.
Name _____ Title _____
Company _____
Street _____ City _____
State _____ Zip _____ Phone ( )

Send to: HERMES PRODUCTS, Inc.
Printer Division
1060 Lower Road, LINDEN, NJ 07036, (201) 974-0600

cess to account information with client/matter master reference, cross-reference lists and client inquiries on the screen.

Through Jan. 31, the Oasys 4100 series bundled with Juris-NBI will be available for $8,999. Juris-NBI will be available for the Oasys 2000 at $4,695. The software is regularly priced at $4,500 for the Oasys 4100 series and $5,500 for the Oasys 2000.

NBI, P.O. Box 9001, Boulder, Colo. 80301.

HMS COMPUTER SYSTEMS, INC.
AIM/3000 Fixed Assets System

HMS Computer Systems, Inc. has announced a fixed assets system for Hewlett-Packard Co.'s HP 3000 series computers.

The AIM/3000 Fixed Assets System is said to maintain asset records and calculate depreciation for financial, federal and state reporting. According to the vendor, the system is code-driven and can permit local or consolidated asset management.

Transactions can be changed through the system without returning to a menu, the vendor said. Users reportedly can permit broad inquiry capability without losing control of update functions. The system is said to be fully on-line with an automatic interface to the company's AIM/3000 General Ledger System.

Price of the system ranges from $4,000 for the HP 3000 Series 37 to $12,000 for HP Series 68 mainframes.

HMS Computer Systems, 4524 E. 67th St., Tulsa, Okla. 74153.

MCBA
Payroll enhancements

MCBA has enhanced its Payroll system, which was written in Wang Laboratories, Inc.'s VS Cobol and runs on Wang's line of VS minicomputers.

According to the vendor, the enhancements include interactive state and local tax tables, expanded federal workman's compensation capabilities, a direct deposit feature and a variety of methods for handling vacation and sick hours. The package is said to allow a user to define a general ledger account number format that uses up to 21 characters and provides five levels of security.

Prices for source code licenses for the Payroll package range from $2,000 to $4,500, depending on the Wang VS model.

MCBA, 2441 Honolulu Ave., Montrose, Calif. 91020.

AMERICAN SOFTWARE, INC.
Distribution Resource Planning systems for Honeywell DPS 8, DPS 88

American Software, Inc. has announced that two of its Distribution Resource Planning (DRP-8) subsystems are now available for Honeywell, Inc.'s DPS 8 and DPS 88 computers running under Honeywell's Geos 8 operating system.

According to a spokesman, the DRP-8 Demand Forecasting System enables marketing management to tailor forecasts according to time, geography, product, volume and dollar requirements. Demand Forecasting includes three standard modules: Basic Forecasting, Item Forecasting and Product Group and Item Forecasting.

The DRP-8 Inventory Management System consists of four modules: Inventory Planning, Distribution Requirements Planning, Inventory Deployment and the Vehicle Scheduling & Loading module.

The initial license fee for the basic DRP-8 Demand Forecasting System ranges from $20,000 to $80,000. For the DRP-8 Inventory Management System, initial license fees range from $20,000 to $65,000.

American Software, 443 E. Paces Ferry Road, Atlanta, Ga. 30305.

ENTERPRISE TECHNOLOGY CORP.
Generalized Reporting System 2.02

Enterprise Technology Corp. has enhanced its Generalized Reporting System (GRS), which runs on Digital Equipment Corp.'s VAX-11 line of superminicomputers under DEC's VMS operating system.

GRS Version 2.02's query language uses one or two commands to produce formatted reports that include page numbers and column headings, according to the vendor. Data summarization statements and an advanced set of calculations allow the user to aggregate data and perform complex analyses, Enterprise Technology said.

The enhanced product reportedly supports applications written in VAX Cobol, Basic, Fortran and Dibol. GRS is said to support standard sequential, relative and indexed file structures.

GRS is priced at $6,500.

Enterprise Technology, 305 Madison Ave., New York, N.Y. 10165.

PARA RESEARCH, INC.
Accounts Receivable

Para Research, Inc. has announced its accounts receivable package designed for the IBM System/34 and System/36 minicomputers.

The product is designed for a large customer base, multiple entity businesses and small businesses.

With the product, a user can follow the day-to-day work flow of an accounts receivable department and examine customer accounts by using a customer inquiry feature that displays open items and customer balances, the vendor said.

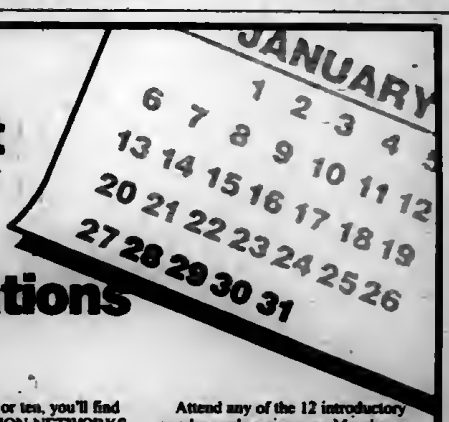
A cash application screen displays 10 open invoices and allows the user to mark one of several for payment, Para Research said. The system will then automatically produce a balance for the accounts.

The package is priced at $2,500, the vendor said.

Para Research, 85 Eastern Ave., Gloucester, Mass. 01930.

See PACKAGE page 70

The four most important days of the new year for telecommunications users!



START "THE YEAR AFTER DIVESTITURE" OFF RIGHT — WITH COMMUNICATION NETWORKS '85.

This is it — America's *national* telecommunications forum — the first, the most comprehensive and the most important conference and exposition of the year. It's the Seventh Annual COMMUNICATION NETWORKS Conference & Exposition, with:

- the *largest* conference program in the industry — some 80 essential seminars, topics and presentations
- the leading industry experts, including the renowned *James Martin, Arch McGill*, FCC Commissioner *Dennis Patrick*, and some 200 other speakers and panelists
- the *biggest* exhibit in COMMUNICATION NETWORKS history, with over 200 exhibitors and 750 booths, so you can see everything the technology leaders have to offer in '85.

BEGINNING AND EXPERIENCED TELECOM PROFESSIONALS WILL BENEFIT

Whether you or your staff have been in the telecommunications field for one year or ten, you'll find COMMUNICATION NETWORKS '85 of major value. In fact, what you learn here will have a significant

impact on how effectively you deal with the constant changes in telecommunications in 1985.

Attend any of the 12 introductory or advanced seminars on Monday, January 28 and, as a special bonus, you'll hear the dynamic James Martin at a special late afternoon lecture. Then choose from more than 70 conference sessions, including user-oriented topics chaired by Association of Data Communications Users members. See the latest products and services on exhibit, relax in exhibitor hospitality suites and enjoy all the attractions of Washington, D.C.

REGISTER BY DECEMBER 14, 1984 AND SAVE $50 ON EACH REGISTRATION.

Don't let anyone you know miss out on 1985's most important telecommunications event. Come for all four days, or any days you prefer, to the largest and best COMMUNICATION NETWORKS Conference ever. Register for three or four days, by December 14, 1984 and save $50 on each registration.

CALL TODAY, OR SEND THE COUPON BELOW TO REGISTER.

800-225-4698

In Mass., 617-879-0700

COMMUNICATION NETWORKS CONFERENCE & EXPOSITION

Washington Convention Center, Washington, D.C., January 28-31, 1985.

Complete seminar information will be forwarded when available. Registrations cancelled later than Jan. 18 are subject to a $50.00 service charge. Registration may be transferred at no charge.

MAIL COUPON TO:
COMMUNICATION NETWORKS '85,
Box 880, Framingham, MA 01701 USA

☐ Sign me up for COMMUNICATION NETWORKS '85 as follows:

	Before Dec. 14	After Dec. 14
☐ Monday Seminar (includes lunch)	$295.00	$295.00
☐ Monday Plus 3-Day Conference & Expo (includes lunches)	$595.00	$645.00
☐ 3-Day Conference & Expo only (includes lunches)	$395.00	$445.00
☐ 1-Day Conference & Expo (includes lunch) (check one) ☐ Tuesday ☐ Wednesday ☐ Thursday	$195.00	$195.00

☐ Payment Enclosed ☐ Bill me ☐ Bill Company P.O. # _____
Charge my: ☐ American Express ☐ VISA ☐ MasterCard
Card Number _____ Exp. Date _____
Signature _____
Name/Title _____
Company _____
Address _____
City, State, Zip _____ Phone ( ) _____

PACKAGE from page 69

JOHN FLUKE MANUFACTURING CO.
Progen

John Fluke Manufacturing Co. has introduced an application software package to handle data acquisition, monitoring and control.

Used in conjunction with the vendor's 2452 Measurement and Control System turnkey computer system, Progen reportedly allows the user to program up to 500 I/O channels for a wide range of applications including batch processing, process control and automated testing. No programming knowledge is required to use the menu-driven Progen.

Progen enables the user to divide applications into separate parts or task groups consisting of related channels, which can then be prioritized by the user.

The software also performs scan tasks together and limit checking, and it executes predefined procedures. Errors are automatically displayed in an error file, the vendor said.

The price of Progen is $2,990.

John Fluke Manufacturing, P.O. Box C9090, Everett, Wash. 98206.

HMS COMPUTER SYSTEMS, INC.
AIM/IMS

HMS Computer Systems, Inc. has introduced the AIM/IMS inventory management system designed to provide distributors, assemblers and light manufacturers with inventory planning and control capabilities in either single or multiple locations. The software runs on Hewlett-Packard Co.'s HP 3000 series under HP's MPE operating system.

According to a spokesman, the three AIM/IMS modules — Inventory Control, Customer Order Processing and Purchasing — are compatible with the current AIM/FMS financial system. Features include the ability to move directly from one transaction to another without return to a menu; multilevel user-defined menus; screen print functions; transaction suspend/resume functions; and an end-user report writer. The system will carry along key information allowing users to access new screens without having to reenter item numbers, order numbers or dates.

The total package is priced between $9,000 and $42,000, depending upon the CPU. Each module may also be purchased separately.

HMS Computer Systems, P. O. Box 35505, Tulsa, Okla. 74153.

PDA ENGINEERING
Patran

PDA Engineering has announced that its geometric and analytical modeling package, Patran, is now available for Evans & Sutherland Computer Corp.'s PS 300 family of three-dimensional computer graphics systems. The modeling package operates on Digital Equipment Corp.'s VAX-11 under DEC's VMS operating system and on the Data General Corp. MV series of superminicomputers under DG's AOS/VS interfaced to the PS 300 system.

According to a spokesman, Patran provides solids modeling, color shaded imaging, finite element generation and analysis and results evaluation. In the Patran/PS 300 configuration, modal vibration animation generated within the PS 300 processor frees the host for further analysis, computations and other tasks. Patran uses solid and surface modeling techniques to allow definition of an engineering mode.

Price of the Patran package for the PS 300 system is approximately $10,000.

PDA Engineering, 1560 Brookhollow Drive, Santa Ana, Calif. 92705.

P-STAT, INC.
P-Stat

P-Stat, Inc. has introduced its P-Stat data management and statistical analysis software package, written in Fortran, for the Sun Microsystems, Inc. Sun Workstation running under the AT&T Unix 4.2BSD operating system.

P-Stat reportedly offers data management, data display, statistical analysis and report-writing capabilities. Features include an on-line Help facility, interactive data entry, relational data base capabilities, macros, statistical commands and expandability through a user link facility. P-Stat combines both interactive and batch processing capabilities.

The price of P-Stat for the Sun Workstation is $2,000 for the first year's license and $1,000/year for annual renewal.

P-Stat, P.O. Box AH, Princeton, N.J. 08542.

INTERNATIONAL DIGITAL SYSTEMS CORP.
RAM 12

International Digital Systems Corp. has announced RAM 12, a wholesale distributor package that runs on Digital Equipment Corp.'s Micro PDP-11 and VAX-11 computers under either DEC's VMS or RSTS operating systems.

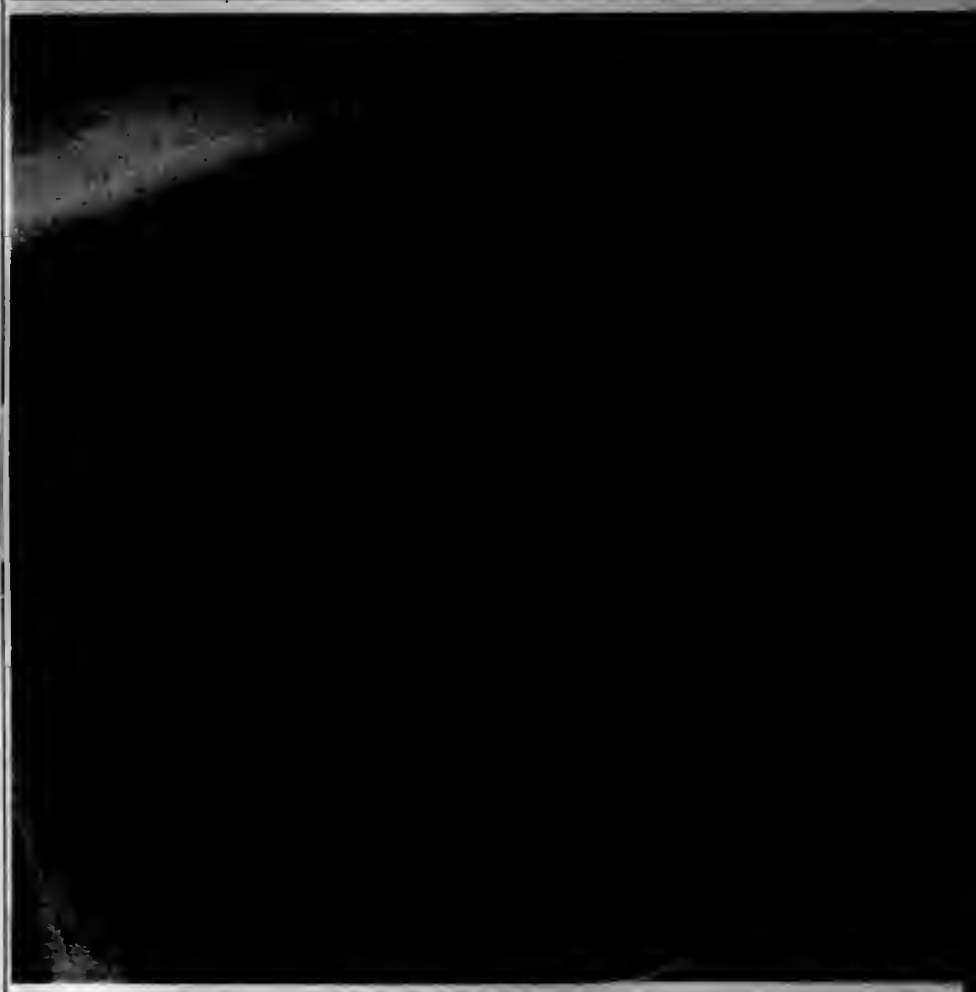
The product consists of customer order processing, puchase order and receiving, accounts receivable, accounts payable, payroll, general ledger and fixed assets and depreciation modules. It features flexible item pricing, order entry checking, inventory tracking and support for blanket purchase orders.

The general ledger system allows up to 13 accounting periods to be defined and permits transaction detail to be kept on-line for an entire year, the vendor said. The product's cost ranges from $10,000 to $30,000.

International Digital Systems, 669 E. Industrial Park Drive, Manchester, N.H. 03103.

James Martin gives you the method... now DDI gives you...

the tool for structured



IBM is a trademark of International Business Machines, Inc. FOCUS is a trademark of Information Builders Inc. DADS is a trademark of Mathematica Products Group. NOMAD is a trademark of DBS Computing Services. MANTIS is a trademark of Cincom Systems. DDSL is a trademark of Applied Data Research. NATURAL is a trademark of Software A G of N. A. AS/U is a trademark of Cullinet Software.

REMEDY from page 63

tenance transactions for customer data alone.

Paper-intensive routing

All processing activity was paper- and labor-intensive with routing, filing and retrieving information not only a logistical problem but also one resulting in extended delays and noncurrency of data. File updating was cyclical, ranging from one week to one month, with magnetic tape used as an interim storage medium. Verifying "check-in-the-mail" responses involved at least a 24-hour delay, followed by extended searches through transaction lists reflecting interim cycle processing.

Previous efforts over several years had failed to produce a sufficiently static environment from which to begin coding within an IBM PL/I CICS environment. Estimates for developing a Customer Information System (CIS) ranged from 60 to 75 man-years, depending on the complexity desired. Other system conversion estimates reflected the same labor-intensive requirements.

"The selection of [Software AG of North America, Inc.'s] Adabas and Natural was based primarily on their reputations for ease of use given the long training curve required for new personnel in other environments. We needed something that was quick, easy to learn and use and that could incorporate frequent changes without requiring data reorganization or recompilation of previously developed programs. Without this software, CIS alone could not have been completed with even 75 man-years of effort, given the amount of change introduced during the development cycle," Berger said.

After selecting a data base management system (DBMS), system development estimates were reduced to 20 man-years, Berger said. The final product was delivered in 27 man-years, including features not contained in the original system requirements. Overall savings, based on corporate development costs, were nearly $1.5 million.

Using the DBMS concept did not initially meet with universal acceptance. With CIS being a utility's "bread-and-butter" application, some members of management were skeptical of the introduction of so-called new technology. "That's putting it mildly," Berger said. "In some cases, there was outright hostility, and rightly so. It had been in development too long with few tangible results. As an end user, I would have had the same reaction."

With nine analysts assigned during peak development periods, CIS was started in January 1981. Extensive problems during the first several months reinforced the belief that the wrong methodology had been chosen. Working in close association with Software AG representatives and serving as both an alpha and beta test site for the new release, Natural 1.2 was implemented.

The first prototype of CIS was installed in December 1982. "We expected all kinds of problems but had relatively few. Other than streamlining a few programs, it was one of the more successful transitions I've ever encountered," Berger said. The initial portion involved replacement PL/I query programs, interfaces to the autocoder system and included customer contact processing, trouble and service call recording and follow-up, name and address changes and general inquiry capabilities. The complete CIS system was installed Jan. 1, 1984.

Most DP shops introduce new technology by starting with a small, easily managed task. However, CIS represented the largest, most important single application within a utility. Driven by user necessity, not only did Central Hudson take on CIS, but also added the conversions of the financial and plant systems in 1982 with an initial staff of three analysts.

CIS is an interactive on-line system providing prompt responses to customer inquiries; creation, scheduling and dispatching of field service orders to and from remote locations; modification of customer account information from any location with point-of-entry editing and correction; and corporate-wide access to current and comprehensive consumer data.

Accounting system

Customer Accounting System is both an on-line and batch support system for CIS and includes meter reading processing, service bill calculation, payment posting, accounting adjustments to customer data, follow-up collection analysis on late and overdue payments and the generation of reports to satisfy internal, state and federal regulatory requirements. The system was designed as a highly modularized application containing more than 850 programs, some 90% of which were written in Natural. The 1982 interim system required only minor modifications to interface to the DBMS rather than autocoder fields.

End-user satisfaction with CIS is reflected by customer services office supervisors who are responsible for handling customer inquiries and complaints. The supervisors find information on customer accounts to be available in greater detail and displayed in more practical formats, permitting faster and better responses for the customer. Besides reducing the delay between the receipt and response to a request, CIS has eliminated the reams of paper that had to be filed and analyzed.

Following on the heels of CIS, the plant and financial systems were installed in April 1984, providing the first interactive on-line access to that data. The flexibility of the Adabas DBMS and Natural made the concurrent conversions possible and made a large dent in the corporate five-year plan.

programming.

While doing research for their recent book,* James Martin and Carma McClure reviewed seventeen diagramming techniques and came to one overwhelming conclusion:

Action diagrams are the simplest and best method of representing structured programs.

Action diagrams combine graphic and narrative notations in a rigorous but easy-to-understand technique. The method is applicable to any size program, in almost any language.

When used to sketch out program logic, action diagrams encourage correct structured thinking. Logic errors become more apparent. Communication improves among programmers, analysts, and end users. And top-down design is enhanced, because action diagrams handle any level of logic, from systems overview to detailed program code.

Diagramming Techniques for Analysts and Programmers Prentice-Hall, 1984

Fast, full-screen editing with ACTION DIAGRAMMER™ and an IBM PC.

Working closely with James Martin, DDI has developed an action diagram editor for the IBM Personal Computer and 100% compatibles. The Action Diagrammer™ editor lets you create and update action diagrams right on the screen. You draw brackets with a single keystroke. Manipulate text with all the power of a visual editor. And expand or contract to focus on any level of detail you choose.

The net result: faster application development

With Action Diagrammer you can develop designs and programs faster, and with fewer errors. Maintenance is easier too, because Action Diagrammer enforces logic structure and provides excellent documentation.

The price is easy too — only $495

The Action Diagrammer software package sells for $495 and comes with a complete user guide, which includes a thorough overview of the action diagramming method. No serious programmer or analyst with access to an IBM PC or compatible should be without it.

Even more features

Represents logic hierarchy with nested brackets for all constructs such as sequence, selection, case, and repetition. Can also represent database actions and subprocedures

Automatically supplies control structure syntax in English, COBOL, PL/I, FORTRAN, C, Pascal, and many 4th generation languages including FOCUS, RAMIS, NOMAD, MANTIS, IDEAL, NATURAL, and ADS/O

Offers one-stroke commands and user programmable function keys

Shifts mainframe software development to PC's

Allows color coding of diagram sections through user control of text and bracket colors (for users who have a color monitor)

Includes simple help messages and other on-line documentation

Produces hard copy of action diagrams on any IBM PC-compatible printer. Graphic output on IBM graphics printer or HP7470A plotter

Database Design, Inc.
2020 Hogback Road, Ann Arbor, Michigan 48104
Software Tools for Martin Methodologies

ACTION DIAGRAMMER is a trademark of Database Design, Inc.

If the space program had advanced as fast as the computer industry, this might be the view from your office.

And space stations, Martian colonies, and interstellar probes might already be commonplace. Does that sound outlandish? Then bear these facts in mind:

In 1946 ENIAC was the scientific marvel of the day. This computer weighed 30 tons, stood two stories high, covered 15,000 square feet, and cost $486,840.22 in 1946 dollars. Today a $2,000 kneetop portable can add and subtract more than 20 times faster. And, by 1990, the average digital watch will have as much computing power as ENIAC.

The collective brainpower of the computers sold in the next two years will equal that of all the computers sold from the beginning to now. Four years from now it will have doubled again.

It's hard to remember that this is science fact, not fiction. How do people keep pace with change like this? That's where we come in. We're CW Communications, Inc.—the world's largest publisher of computer-related newspapers and magazines.

Every month, over 9,000,000 people read one or more of our publications

Nobody reaches more computer-involved people around the world than we do. And nobody covers as many markets. In the United States we publish three computer/business journals. *Micro Marketworld*, for businesses selling small computers and software. *On Communications*, the monthly publication covering the evolving communications scene. And *Computerworld*, the newsweekly for the computer community, is the largest specialized business publication of any kind in this country.

We also offer seven personal computer publications. *InfoWorld*, the personal computer weekly, is a general interest magazine for all personal computer users.

The other six are monthly magazines that concentrate on specific microcomputer systems. *PC World*, the comprehensive guide to IBM personal computers and compatibles. *inCider*, the Apple II journal. *Macworld*, the Macintosh magazine. *80 Micro*, the magazine for TRS-80 users. *HOT CoCo*, the magazine for TRS-80 Color Computer and MC-10 users. And *RUN*, the Commodore 64 & VIC-20 magazine.

And we have similar publications in every major computer market in the world. Our network of more than 55 periodicals serves 25 countries. Argentina, Australia, Brazil, Canada, Chile, Denmark, Finland, France, Greece, India, Italy, Japan, Korea, Mexico, The Netherlands, Norway, People's Republic of China, Saudi Arabia, Southeast Asia, South Africa, Spain, Sweden, United Kingdom, United States, and West Germany.

The sooner we hear from you, the sooner you'll hear from our readers

Simply put, we'll make it easy for you to reach your target audience — and for them to reach you. Call today for more information. You'll find the number below.

CW COMMUNICATIONS/INC.
375 Cochituate Road, Box 880, Framingham, MA 01701
(617) 879-0700

SOFTWARE & SERVICES

SI from page 63

umentation. The major new product in this area will be a query system to be released next year. The package, which is based upon Software AG of North America, Inc.'a forthcoming Supernatural language, will eventually offer borderless query across all Software International applications. The query language will first run on general ledger files, but will be added to new releases of all other financial applications.

Smart Link capabilities will be incorporated into all financial products over the next year, Tatum said. Currently, Smart Link only supports Software International's general ledger package. Common screens and transactions are an area of particular emphasis.

"If you look at general ledger and accounts payable now, it's hard to believe they were built by the same company," Tatum said. "In the future, all screen definitions will reside externally to the applications, and we will provide tools to change the definitions to suit your shop without going into the application program."

Help screens

Help screens will be designed so that they can be loaded into customer libraries for access by programmed function keys, Tatum said. Users will be able to access a Help screen and return to the original transaction screen without losing any of the attributes of the transaction screen, a feature called "sticky cursor."

Security, navigator aids and queries will be standardized through a system manager that Software International has been employing to rebuild the on-line portion of its applications for the last 14 months.

The system manager, which includes a fourth-generation language, will make Software International applications virtually independent of a teleprocessing monitor or data base management system (DBMS). All data base interfaces will be accomplished through a set of generic calls that do not require programs to rely upon a specific DBMS, he said.

In addition, all teleprocessing-monitor-dependent calls will be removed from the system manager.

In all, Software International plans "one release next year for each major product," Tatum said. "There will be only one, and it will be thoroughly tested and documented."

Tatum acknowledged the weaknesses of past Software International release policies, which in one instance had two releases sent out less than three months apart.

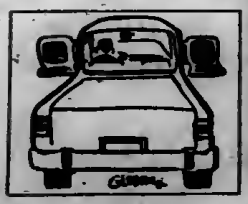
"Software International was doing a very poor job in certain areas," he said. "We were developing systems without a real commitment to education. The documentation was substandard, and we didn't have a commitment to quality assurance. Releases were going out without adequate testing. I don't think management really understood the effects that had on the customer."

Aided in large part by the influx of $33 million in capital since General Electric Co. acquired it in 1982, Software International has entirely reorganized its development and support functions. Previously, Software International "was so bogged down in support activities that we weren't developing new products," Tatum said.

Under the new structure, a staff of 64 will work solely on new development. A separate staff will work entirely on customer support and maintenance. Software International plans to spend $12.2 million on documentation next year, he added.

In addition, the company will attempt to shorten the time required to convert applications from IBM mainframes to the variety of minicomputers the company supports. Previously, such migrations had taken up to one and a half years to complete.

Software International has entered into agreements with a number of smaller vendors that will perform the conversions from the mainframes to systems from Wang Laboratories, Inc., Digital Equipment Corp. and Hewlett-Packard Co.



GROUP from page 63

much easier and cheaper to manage, but do not offer nearly as much flexibility as those administered by users. If your goal is to learn from the vendor and to mix with other users, this may be an acceptable alternative. If you are more interested in forming a distinct body to air gripes and suggestions, the independent groups have more clout.

If you choose to go the independent path, be aware of the commitment it requires. For large groups in particular, the officers may spend as many as 50 hours in preparation during the month prior to a conference. They should also plan to meet at least two or three other times during the year for a day or more.

■ Should your group structure be centralized or decentralized? Some groups rely on local users groups to hold frequent meetings and then to consolidate concerns and observations at an annual gathering. Others hold large, semiannual, national meetings for all users. If you decide to emphasize regional groups, think about what role they will play in the annual conference. You will want to exchange ideas on running the separate groups as well as technical and management issues.

■ Should you charge dues? This is a good idea if you want to do more than just hold an annual conference. One users group, however, bypasses dues by simply planning for a surplus after its annual meeting. The windfall funds other programs during the year.

■ How do you want to communicate among members and between the users group and the vendor? An important function of a users group is to provide feedback to the vendor. The best way to compile that material is to communicate among users. Do you want to publish a newsletter? Fund an annual survey? Stick to regular telephone contact?

■ Where and when should national conferences be held? This depends largely on where the members are located. Most companies do not have deep pockets when it comes to travel budgets. It makes sense to move conference sites to various locations around the country at different times of the year so that everyone gets a chance to attend at least once every two years.

■ What do users expect from a conference? A young company will probably have many new users who are interested in more basic instructional sessions. A more experienced user base will get more out of "rap" and "helpful hint" sessions. This affects not only the makeup of your agenda but also influences how much representation you want from the vendor. Tips and techniques are better presented by other users.

■ What is the makeup of the user base? Is it mostly DP or mostly nontechnical users? Your conference agenda should reflect your audience. Make sure there is an adequate number of sessions for each group. Do not forget to include the new users.

■ Who should serve on the advisory board? These people are looking at a commitment of 20 to 100 hours each year to attend to administrative tasks. Their companies should be willing to give them the time and travel budgets to perform their duties.

It is also important that the advisory board reflects a mix of DP people, end users and new users with regional considerations also in mind. You do not want the board to be too large, but you want it to represent the concerns of the user base.

■ How should conferences be organized? The most successful meetings seem to be those that plan tracks organized around different product lines. Some attention should also be given to industry groupings — banking, manufacturing and so on. Plan for a good mix of success stories and technical sessions along with product demonstrations, previews of new releases and gripe sessions.

■ Should you invite the media? Some groups feel this is an excellent way to gain visibility for themselves and for the products. Others feel stymied and nervous when members of the media are around. This is an individual decision of your users group.

Try attending a meeting of an established users group for a product that you are considering or already have in-house. There are many excellent users groups out there.

Cityscape to alternative resources: solar, wind and geothermal technologies are applied to maximize energy efficiency. Solar panels form windscreens which rotate parallel to desert surface; temperatures of air and water supplies are maintained by flows through buried conduits.

If You Can Imagine It...

CYBER Can Run It.

It's true. The uses of the CYBER 180 computers are limited only by the breadth of the human imagination.

So the question is not whether you could benefit from this kind of computer power. The question is, does a CYBER fit your budget?

To this question, Control Data has developed an astonishing new answer.

Introducing the Supermini 810.
The new 64-bit word Supermini 810 does everything you'd expect of a supermini system. But that is only the beginning.

In terms of all the usual criteria — performance, application portability, compatible growth potential, ease of installation and the increasingly sensitive matter of security — the Supermini 810 represents some very impressive technology.

But the most impressive aspect of this new supermini computer system may be its price.

The incredible $250,000 system.
Actually, a Supermini 810 could

run less than $250,000.

And, we're not talking some barebones unit either. We're talking about a state-of-the-art supermini system, complete with operating software and peripherals, up and running. The more you learn about the system the better that price looks.

CYBER power begins where other systems reach their limits.
You can look at the Supermini 810 as the ultimate supermini computer system. It's exciting enough in those terms. But it is *only* the entry point to a compatible family of systems that boasts a 1-to-60 performance range. That is the largest compatible growth path in the industry.

So when you look beyond today and see the potential to accommodate growth, you can really appreciate the significance of this new system.

With the CYBER 180 performance range you can, if you wish, enter fully into supercomputing. You can expand your computing power as your future needs warrant. And you can do it in an orderly fashion, and at manageable costs, without massive operational disruptions.

You can start with a call or letter.
We hope what you've learned so far will stimulate you to explore the possibilities presented by the Supermini 810. You can do that by calling 1-800-253-4004 ext. 146. (In Minnesota, 1-612-921-4400 ext. 146). Or by writing Computer Systems Marketing, Control Data Corporation, P.O. Box 0 HQW09G, Minneapolis, MN 55440.

CONTROL DATA

Addressing society's major unmet needs as profitable business opportunities.

PHASING from page 63

evaluated in terms of risk vs. return on investment, both short- and long-term. Typically, information management projects are justified on the basis of a long-term payback. Unfortunately, the critical factors related to assessing the risk of a project are seldom considered. This results in risk never being quantified, causing long-term investments to be made in information management systems without understanding the implications of those investments or the real costs involved. Focus is commonly limited to technological and programming issues without regard for basic business principles.

The first and foremost problem that must be dealt with is how to phase in a system in a manner that will best support the strategic direction of the organization. Since corporate MIS managers are usually not involved in the strategic planning process, they are often unaware of strategic direction. Therefore, these strategic issues cannot be factored into the phasing in of new information management systems. Without this knowledge, the implementation could be doomed from the start. Unfortunately, this failure is sometimes only discovered after the new information management system has been in operation for several months.

The next critical factor relates to the impact of the phasing-in strategy upon the organizational structure. Common sense dictates that monolithic solutions related to the organizational structure are rarely successful. Among the reasons for the failure of such monolithic solutions are the following:

- They require tremendous organizational commitment from the board level down to be successful.
- They demand a higher degree of consensus among all the organizational entities involved.
- They take a long time to effect.
- They challenge the very foundation of the organization itself.

After all, the purpose of these information management systems is to support the business functions — not for the business functions to support the information management systems.

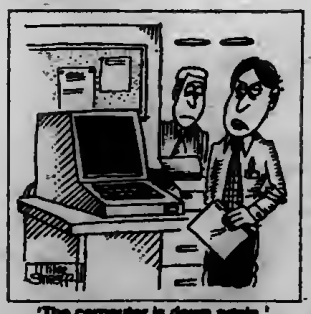
After resolving the strategic and organizational issues, cultural critical factors must be addressed. Given that the phasing-in strategy supports the strategic direction and does not severely impact the structure of the organization, the impact on the functional users of the information management system must be considered. Even the best-built information management system will fail if not embraced by the users. Therefore, the phasing-in strategy must take into consideration how to institutionalize the information management environment among its users.

The final critical factors are technology-oriented. These break down into two major categories: data base issues and equipment and software issues. The data base becomes the foundation for any information management system. It dictates how the data is inherently organized and, therefore, how it can be accessed, manipulated and extracted. Restructuring data bases is not a trivial process. Any successful phasing-in strategy must take into consideration the structural relationships of the entire information management environment.

Equipment and software issues include such things as languages, data base management systems, networking, telecommunications, hardware and so on. Proven technologies are those that have been successfully used and deployed within the public sector. Strategies that incorporate leading-edge technologies that do not fall within the definition of "proven" threaten the feasibility of a phasing-in strategy. Considerations such as industry support and direction, product reliability and vendor stability must be given careful consideration when leading-edge technologies are incorporated into a phasing-in strategy.

The first and foremost problem that must be dealt with is how to phase in a system in a manner that will best support the strategic direction of the organization.

In summary, a good phasing-in strategy should have a self-testing mechanism to monitor its performance against the critical factors. The traditional technological focus for approaching phasing-in strategies has delivered less than optimum results. Therefore, organizational and cultural issues must be given more emphasis than technological issues. This implies that corporate MIS managers must be competent to address the critical factors at all levels before committing to a phasing-in strategy.



'The computer is down again.'

Imagine.™ Expand the way you think about information retrieval. It's the only query and reporting system built for CICS with: Entirely menu-driven architecture • Integrated on-line and batch query and report writing • Comprehensive system-managed control of CPU resources and data security. • Integration of production files into an on-line informational data base. For more information, call (617) 547-8050.

MULTIPLICATIONS ✳

UCCEL has selected Imagine for use with its application software products. Multiplications has offices in the following locations: Cambridge, MA. Atlanta, GA. New York, NY. Oakland, CA. Rochester, NY. Toronto, CN.

© Multiplications Software, Inc. 1984 Imagine is a trademark of Multiplications Software, Inc.

COMMUNICATIONS

New satellites may be fixable

DATA STREAM
John Dix
CW Senior Editor

The recent rescue of two stray communications satellites by the space shuttle *Discovery* verifies the technical feasibility of recovering communications satellites to retrofit them on Earth and hints at the future capability of repairing satellites in space.

Space-walking astronauts Joseph P. Allen and Cmdr. Dale A. Gardner left the confines of *Discovery* on its latest mission to wrestle two satellites — the 1,200-lb Indonesian *Palapa* satellite and Western Union Corp.'s *Westar 6* satellite — into the shuttle's cargo bay.

Using the craft's mechanical grappling arm and some perseverance, the astronauts bested a design oversight that left useless a mounting bracket manufactured for the rescue of the *Palapa* satellite and manhandled that bird into its nest. The recovery of the *Westar 6* was less problematic.

Both satellites have been floundering at low altitudes since their payload assist modules failed to elevate them to the necessary 22,300-mile orbit after being launched on a previous shuttle mission. In this low altitude, the satellites were impossible to use. At the proper 22,300-mile altitude, satellites obtain what is known as a geosynchronous orbit — synchronized with the Earth and appearing from the ground to be stationary. This makes the satellites available for constant use.

Using the satellites' apogee kick motors and their reaction control systems, both crafts were lowered from the 600-mile orbit they had achieved to within the 300-mile orbital ceiling of the shuttle.

It is this altitude limitation that restricts the shuttle from being used to rescue existing communications satellites that are reaching the end of their roughly eight-year life span.

The shuttle's range of flight is determined by the amount of fuel the craft

See FIXABLE page 80

T1 system controls net parameters

IDNX allocates bandwith, reroutes clogged circuits

By James Connolly
CW Staff

NEW YORK — Network Equipment Technologies, a California-based manufacturer, recently announced its first product, a communications processor meant to be used with wideband T1 carrier facilities that incorporates automated network management.

The Integrated Digital Network Exchange (IDNX), announced here, was designed to manage digital T1 1.54M bit/sec lines carrying voice, data and video transmissions.

A key feature of the system is its ability to allocate bandwidth dynamically to voice, data and video circuits on demand and according to priorities. A company spokesman said that, for example, the system can carry large amounts of voice traffic during the day and automatically reallocate bandwidth to transmit greater amounts of data at night when the voice demand lessens.

Now installed at beta test sites and scheduled for January deliveries, IDNX also features dynamic alternate routing of circuits when an original route becomes congested or fails. Previously, that capability had been available only to public telephone companies, not on private nets.

To improve voice throughput, IDNX is said to use adaptive differential pulse code modulation to compress standard 64K bit/sec voice transmissions to 32K bit/sec and digital speech interpolation to produce an additional 2:1 compression ratio.

Digitized voice input is directly from D3/D4-compatible channel banks or digital private branch exchanges (PBX). The company said it is compatible with all major digital PBXs.

See IDNX page 78

■ Datapoint Corp. introduced an Arcnet interface for the IBM Personal Computer AT and terminal emulation capabilities for the IBM Personal Computer and Personal Computer XT/80

■ Dyna Five Corp. has introduced an eight-channel asynchronous communications module designed to be compatible with Digital Equipment Corp.'s Q-bus/80

■ Hayes Microcomputer Products, Inc. unveils a 2,400 bit/sec Smartmodem/80

INSIDE

Controllers/80

Multiplexers/Modems/80

Gandalf Data adds PACX 2000

Network switching system links workstations

WHEELING, Ill. — Gandalf Data, Inc. has announced PACX 2000, a distributed networking switching system introduced as part of its Pacxnet family of products.

PACX 2000 is said to be software controlled and designed to handle all of the networking requirements of intelligent devices such as personal computers and word processors. Operating as either a local-area network or wide-area network, it ties together workstations so they can communicate with each other and links groups of workstations in one center to another center or to the corporate mainframe, the company said.

The PACX 2000 is based on 16-bit microprocessors and employs some fiber optics. Reportedly, the device handles a standard data rate of 64K bit/sec, up to 19.2K bit/sec for asynchronous data and is transparent to data speed and code. The switch is said to allocate switching capacity based on demand.

According to Gandalf, the PACX 2000 features a menu-driven console control; network configuration flexibility; messaging to inform users of network changes; a continuous activity log for network usage analysis; and on-line maintenance.

It handles a maximum of 896 lines and costs about $195 per connection, according to the vendor.

Gandalf Data is located at 1019 S. Noel, Wheeling, Ill. 60090.

GTE Telemessage linked to text messaging services

STAMFORD, Conn. — GTE Corp. has announced that it is interconnecting its Telemessage voice messaging service with its Telemail electronic mail service and other text messaging services.

The connection will allow Telemessage users to deliver messages in printed form, as well as by voice, according to the company.

Conversion of voice messages to text will allow the message to be delivered to data terminals, word processors and personal computers. In addition, Telemail subscribers will have the option of having their text messages converted to voice form.

GTE's central Telemessage system will handle the conversion, polling incoming subscriber mail every hour for messages requiring conversion, the GTE spokesman said. The conversion process will be through computerized voice-to-text and text-to-voice processes. The converted message will then be routed to the appropriate electronic mailbox for the recipient to review, redirect or save.

GTE now has Telemessage service centers in Dallas, New York and Los Angeles, and plans to open centers for Boston, Chicago, San Francisco and Washington, D.C., before the end of 1984.

Voice-to-text conversion costs $4 per 400 characters, and text-to-voice conversion costs $2 per 400 characters.

GTE, One Stamford Forum, Stamford, Conn. 06904.

Distributed Logic unveils multiplexing subsystem

ANAHEIM, Calif. — Distributed Logic Corp. has introduced an asynchronous communications subsystem designed to permit Digital Equipment Corp. computer users to multiplex from 16 to 128 local or remote communications devices.

The Optimux/32DMF+ is said to be a self-contained system expansion unit with its own 20A power supply, cooling fan and four printed-circuit card slots. It is intended for use with DEC PDP-11, VAX-11 and Decsystem-10 computers.

The basic configuration includes a single Optimux/16DMF+ asynchronous communications controller and a distribution panel for connection of up to 16 lines.

The subsystem offers a switch-selectable choice of DEC's DMF32 or DH11/DM11 protocols. Throughput is enhanced by the unit's capability for bidirectional flow control and its multiword direct-memory access burst mode, according to the vendor.

It offers software-selectable data transfer rates from a minimum of 50 bit/sec to 38.4K bit/sec.

It may be rack-mounted in 19-in. cabinets or packaged in a 3½-in.-high enclosure. It is cabled to the DEC Unibus, allowing daisy chaining of multiple controller boards and lines for connection of up to 128 lines.

The rack-mounted version with a single Optimux/16DMF+ controller and distribution panel costs $4,500.

Distributed Logic, 1555 S. Sinclair St., Anaheim, Calif. 92806.

IDNX from page 77

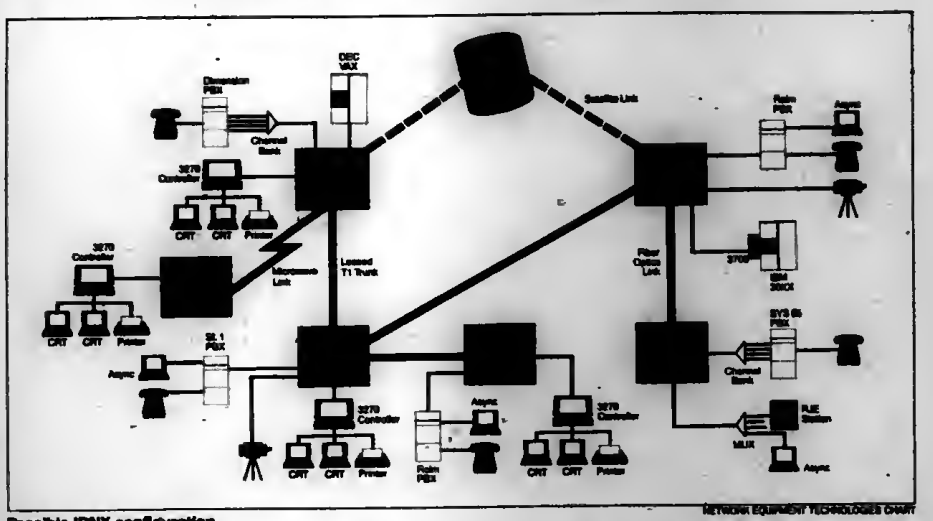
The system, targeted at large corporate T1 networks, can support up to 32 T1 trunks, with 768 addressable ports — 512 of which can be active simultaneously.

The company emphasized the system's flexibility, saying that it can be configured in many topologies, including point-to-point and fully meshed networks, with each node connected to several other nodes.

The company emphasized IDNX's flexibility, saying that it can be configured in many topologies.

Networks reportedly can be designed for the individual customer's needs, and the IDNX can be instructed to manage the network according to the customer's specifications. One such instruction could be analysis of the noise levels on a circuit and the automatic rerouting when the noise becomes excessive, a spokesman said.

The company said the IDNX includes redundant modules for all hardware whose failure could result in a node or trunk outage. Switchover to redundant hardware is said to be automatic, and installation or replacement of circuit boards in the refrigerator-size box reportedly can be done without interrupting service.



Possible IDNX configuration

NETWORK EQUIPMENT TECHNOLOGIES CHART

The IDNX is intended to replace less intelligent T1 multiplexers and is said to be compatible with T1 products and services from AT&T, the regional telephone holding companies and other common carriers. It was designed to interface with private digital microwave radios, fiber-optic and coaxial cables and satellite earth stations.

The data ports are said to support standard interfaces such as RS-232C, V.35 and RS-422/449 at synchronous rates from 1.2K to 1.34K bit/sec.

One beta test site user, Robert Anderson, assistant vice-president for telecommunications at Bankers Trust Co. in New York, said his company is using three IDNX nodes in a 60-day test. He said the test, which was half complete when the product was announced, is still at the evaluation stage and that his technicians have been examining the product's ability to withstand replacement of boards and changes in the network.

A Network Equipment Technologies spokesman said the IDNX operates at the physical link layer of the International Standards Organization Open Systems Interconnect model, transferring bits transparent to protocol between computers.

Pricing is based upon the configuration desired, ranging from $40,000 to $150,000 per node, with a typical customer paying $90,000 to $100,000 per node. Network Equipment Technologies is located at 1060 Marsh Road, Menlo Park, Calif. 94025.

Before you applaud IBM's song and dance for the 3725 Communications Controller, talk with Centron DPL about your 3705.

Your 3705 is a tough act to follow.

Chances are good that your 3705 will fill your needs at considerable savings for some time to come. Centron DPL has the hardware, technical services, and financial expertise to coax an encore from your 3705.

Add memory up to a megabyte.

You still have the option to upgrade to 512K using IBM memory, but the 3705 was built with the potential for even more. Centron DPL will build your 3705 memory up to a *full* megabyte.

Add an expansion frame to increase the number of available lines.

In many ways, your 3705 is more flexible than a 3725. It allows you to add lines as you need them, and you can continue to run asynchronous lines.

Centron DPL has model upgrades and expansion units in stock for immediate delivery at significant savings.

Lease a communications controller from the company that understands your need for flexibility.

Centron DPL will write a lease that fits your requirements; whether it's a purchase/leaseback, a lease for additional features or upgrades, or a short-term 3705 lease interim to your 3725 acquisition.

Since we maintain control of the lease, you can upgrade or add features of any size at any time. The rates for upgrades can be set in advance to offer you price protection.

We support our leases with an extensive inventory of features and upgrades, our *own* technical services division, and a complete refurb center.

Discuss your 3705 with one of our representatives today. We'll show you that it may be too early to let the curtain fall.

MAKE YOUR 3705'S PRICE/PERFORMANCE AN ENCORE.

Centron DPL Company

7480 West 78th Street
Minneapolis, MN 55435 • 612/944-9161
Call Toll-Free 1 800 532-7532
In the Lakes Region Call 414/797-8900
In the Southeast Call 305/629-5353

Only Answer/DB connects all these dots.

The more mainframe access you give your users, the happier they'll be.

They'll be more productive, too.

Answer/DB™ is fast becoming the industry standard for universal data access. It addresses every mainframe file with a single, easy-to-learn language.

Users can get answers to simple queries on-line. It makes them more efficient, and your company more competitive.

Answer/DB operates in OS and DOS, interfacing with all database structures—in TSO, IMS/DC or CICS environments.

Users can integrate data from several files and generate detailed reports and inquiries—without DP help.

They can even download data to personal computers, where they can use it in the familiar PC programs they already know. Answer/DB interfaces with LOTUS™/Answer™, dBASE™/Answer™ and VisiAnswer.™

Answer/DB frees DP staff from routine tasks and request bottlenecks. But it keeps control of the mainframe resources and complete security at the DP level, where it belongs.

If you'd like to sample Answer/DB, without the pressure of a presentation, mail this coupon. We'll send a demonstration package, free of charge.

In less than an hour, you'll see that Answer/DB is powerful enough to deliver all the data your users need.

Yet so easy, it's almost child's play.

Yes, happier users sure would be nice. Send me a free Answer/DB demo package.

NAME _____ TITLE _____

COMPANY _____

PHONE ( ) _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

I AM INTERESTED IN END USER:

☐ REPORTING ☐ INQUIRY ☐ MICRO-MAINFRAME LINK

MAINFRAME TYPE _____ OPERATING SYSTEM ☐ OS ☐ DOS

TP MONITOR ☐ IMS/DC ☐ TSO ☐ CICS _____ OTHER

MICROCOMPUTER TYPE _____

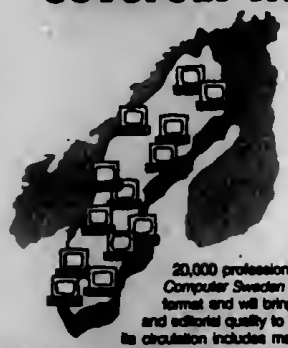
MAIL TO: ANSWER/DB DEMO PACKAGE
P.O. BOX 1488, CANOGA PARK, CA 91304

CW1139

Answer/DB is a U.S. Registered Trademark of VisiCorp. VisiCalc is a trademark of Software Arts, Inc. dBASE II, dBASE III and Paradox are Trademarks of Ashton-Tate. Lotus 1-2-3 and Symphony are Trademarks of Lotus Development, Inc. RAMIS II is a registered trademark of Information Builders Group, Inc. Answer is a registered Trademark of Informatics General Corporation.

informatics general corporation.

We've got the Swedish computer community covered. Have you?



In 1982, sales of computer hardware, software and services reached $1.2 billion in Sweden. This market is expected to grow at an annual rate of 18% with the government and manufacturing industry being most effected.

And now our new sister publication, *Computer Sweden*, can bring your advertising message to 20,000 professionals in this expanding marketplace. *Computer Sweden* is published bi-weekly in a tabloid format and will bring *Computerworld's* high standards and editorial quality to the Swedish computer community. Its circulation includes managers, marketing directors, engineering management at computer hardware, software and service suppliers, educators, consultants, DP managers and technicians.

CW International Marketing Services is your one-stop advertising service in countries around the computer world. For more information about *Computer Sweden* or any of our other foreign publications, just fill out the coupon below.

Diane La Mangia
Manager, International Marketing Services
CW COMMUNICATIONS, INC.
375 Cochituate Road, Box 880, Framingham, MA 01701
(617) 879-0700

CW COMMUNICATIONS/INC.
Publishers of Computerworld and other leading computer publications around the world.

Please send me more information on:
☐ *Computer Sweden* ☐ Your other foreign publications
Name _____ Title _____
Company _____
Address _____
City _____ State _____ Zip _____

UNLIMITED LAB TIME FOR CICS

LEARN AT THE TERMINAL
- CICS 1.6 COMMAND LEVEL
- CICS LOGIC AND DEBUGGING
- CICS DESIGN
- CICS INTERNALS
- VSAM TUNING
- VSAM FOR THE APPLICATION PROGRAMMER
- IMS / DLI
- ADABAS
- ADS / ONLINE
- IDMS COBOL PROGRAMMING
- IDMS SYSTEM COURSES
- VTAM

LAB HOURS
9 am – 9pm Mon-Thur | 9--5 Fri – Sat |

HANDS-ON TRAINING CENTER

MAKE YOUR OWN HOURS TO BECOME AN EXPERT

call us -or- write

ICCS
CORPORATE TRAINING CENTER
18 EAST 21st St., (BROADWAY)
NEW YORK, N.Y. 10010
TELEPHONE: 212-777-5040

Name _____
Title _____
Company _____
Address _____
_____
Telephone _____

COMMUNICATIONS

Datapoint offers support for three IBM micros

SAN ANTONIO — Datapoint Corp. has introduced a networking product for the IBM Personal Computer AT and terminal emulation capabilities for the IBM Personal Computer and Personal Computer XT microcomputers.

The Intelligent Network Executive-PC (INX-PC) is an adapter card designed to fit in an expansion slot on the AT, enabling the user to link the micro to the Datapoint Attached Resource Computer local-area network. It reportedly allows the AT to serve as an applications processor.

INX-PC is a user-installable card costing $695 and software costing $75. PC8220 is a software package that enables IBM Personal Computers and Personal Computer XTs to emulate a Datapoint 8220 terminal. It reportedly supports both Datapoint operating systems, RMS and DOS, and gives the IBM user access to Datapoint office automation software, data processing capabilities and communications resources. The cost of PC8220 software is $175.

Datapoint, 9725 Datapoint Drive, San Antonio, Texas 78284.

CONTROLLERS

DYNA FIVE CORP.
D5-CI100-8

Dyna Five Corp. has introduced an eight-channel asynchronous communications module designed to be compatible with the Digital Equipment Corp. Q-bus.

The D5-CI100-8 serial communications interface module provides 22-bit addressing and is capable of operating at speeds from 50 to 19.2K bit/sec, according to the company.

It reportedly is software- and plug-compatible with DEC's DLJV11 interface and allows each channel to be independently configured.

It costs $745 and is available at quantity discounts.

Dyna Five, 12040 Western Ave., Garden Grove, Calif. 92641.

MULTIPLEXERS/ MODEMS

HAYES MICROCOMPUTER PRODUCTS, INC.
Smartmodem 2400

Hayes Microcomputer Products, Inc. has introduced a 2,400 bit/sec modem, the Smartmodem 2400, that reportedly meets the CCITT V.22 international standard for 2,400 full-duplex communications.

The Smartmodem 2400 is also said to meet the CCITT V.22 standard for 1,200 bit/sec communications and to be similar to V.25, the proposed standard for autodial capability.

According to the vendor, the device meets AT&T 212A and 103 requirements and can be switched by the user between CCITT and AT&T-compatible transmissions.

Smartmodem 2400 is said to operate synchronously at 2,400 bit/sec, 1,200 bit/sec and 600 bit/sec and asynchronously at 2,400 bit/sec, 1,200 bit/sec and up to 300 bit/sec.

It features call progress monitoring, voice/data switching and the ability to set communications instructions with keyboard commands instead of with mechanical switches. The Smartmodem 2400 also features a superset of the Hayes AT command, making it downwardly compatible with the Smartmodem 300 and Smartmodem 1200, the vendor said.

Smartmodem 2400 is priced at $899.

Hayes Microcomputer Products, 5923 Peachtree Industrial Blvd., Norcross, Ga. 30092.

FIXABLE from page 77

carries. A National Aeronautics and Space Administration (Nasa) spokeswoman said that the agency has thought about outfitting the shuttle with additional orbital maneuvering systems to increase its range, but even then, it would only be able to reach an orbit of 600 miles.

While it was possible to pull the *Palapa* and *Westar 6* birds down from their 600-mile orbit under their own power, none of the communications satellites now in use have the necessary fuel supply to bring them down from 22,300 miles. A spokesman for Satellite Business Systems (SBS), a carrier based in McLean, Va., said that a satellite would need as much fuel to get it down from a geosyncrhonous orbit as was required to lodge it there, or the equivalent of two payload assist modules. The extra payload assist module would have to be made at the expense of satellite power and transmission capacity.

To get around this, some scientists are toying with the idea of using a "space tug," a device that would be launched from the shuttle and used to retrieve satellites, an SBS spokesman said. They estimate that such technology is still 10 years away.

By then it is possible that the satellites in orbit will have been manufactured so that they may be repaired in space, instead of having to be brought back to Earth to be retrofitted. The first satellite to be designed with this concept in mind was Nasa's *Solar Maximum*, which is used to study solar flares.

Sometime after the Solar Maximum was launched, its altitude control module failed. In April of this year, the space shuttle *Challenger* caught up with the bird, which maintains a low altitude, and swapped the bad module with a replacement component.

In the future, all domestic communications satellites may be manufactured in a similar modular manner, enabling parts like fuel pods, transponders, solar arrays and guidance components to be changed in space. This would vastly extend the life expectancy of satellites, which cost upward of $40 million or $50 million to build, and would potentially lower the cost of using satellites for long-haul communications.

SYSTEMS & PERIPHERALS

Harris releases 32-bit workstations

FORT LAUDERDALE, Fla. — Harris Corp. has announced the Harris Station 10 and Station 20 Unix-based dual 32-bit workstations, said to deliver 0.575 Whetstone millions of instructions per second processing power and incorporating the Motorola, Inc. 68010 and 68000 microprocessors.

Aimed at engineering, scientific and software development applications, the workstations support the Ethernet local-area network (IEEE 802.3) and the AT&T System V version of Unix. The workstations use multiple 32-bit very large-scale integration (VLSI) microprocessors.

The HS-10 monochrome and HS-20 color workstations operate either as stand-alone computers, graphics systems, Ethernet network nodes or RS-232 terminals for Harris superminicomputers.

Both workstations incorporate the floating-point processor and array processor options for scientific applications. A dual bus architecture reportedly enables workstation system modules to communicate with each other via the 8M byte/sec system bus, while the peripherals connect through an enhanced 6M byte/sec Intel Corp. Multibus.

Harris workstations are reportedly effective for single-user projects in CAE, research and Unix software development.

According to Harris, the single-board floating-point processor is coupled to the CPU via the 8M byte/sec bus for maximum performance. With the Ethernet option, information can be moved between workstations at a 10M bit/sec rate, the company said. Single Harris workstations or a network of workstations can be connected to Harris superminis via Ethernet with the Department of Defense's TCP/IP protocol.

A range of peripheral, memory and performance options are reportedly possible, with the 8- or 15-slot backplanes in the HS-10 and HS-20. An accelerated Intel Multibus interface in the workstations handles mass storage devices and graphics subsystems, the company said. With the multitasking features of Unix, each user can display up to 15 text windows and 16 graphics windows. The monitors feature a noninterlaced 60-Hz refresh rate.

The HS-10 features an independent graphics processor with 256K bytes of display memory on a plane of dual 128K-byte frame buffers. The HS-20 supports up to 1.2M bytes of display memory on 10 planes of dual 64K-byte frame buffers, for 1,024

See HARRIS page 86

■ Genigraphics Corp. has announced three workstations based on Digital Equipment Corp. micros for producing presentation-quality graphics/82

■ Lisp Machine, Inc. has unveiled an artificial intelligence software development system/83

INSIDE

Turnkey Systems/83
Terminals/88

Data storage: Bubble returning, optic emerging

By John Desmond
CW Staff

LOS ALTOS, Calif. — Magnetic bubble memories and optical disk technologies are capable of serious penetration into the data storage market, according to a recent study of rigid disk drives by Disk/Trend, Inc. based here.

The study, titled "1984 Disk/Trend Report," said bubble memories are now being used in many harsh environments and are being designed into selected DP systems, such as portable computers. And some nonreversible or write-once optical disks have achieved the status of commercial products, the report stated.

Write-once optical systems are capable of higher densities than magnetic recording techniques now in use, and some planned systems could provide access to a large number of optical disks under system control, with several gigabytes on each disk. While not yet demonstrated, "advocates of various types of optical disk media technologies believe that their disks will provide archival lives which equal or exceed those of magnetic media," the report stated.

Two types of optical storage systems are available: document storage and data storage. Systems for storing document images are being offered by Toshiba, Ltd. and Matsushita Electric Industrial Co. in Japan, where the report said the optical emphasis arises from the complex Japanese alphabet. While the report predicted that optical document storage will not be able to compete on a price per image basis with microfilm, it said, "The fast and convenient access to stored images provided by optical disk systems will probably create a major place for them in the emerging OA market."

Optical data storage systems are available from a variety of firms, including Storage Technology Corp. (STC), Control Data Corp., Xerox Corp., Hitachi Ltd., Toshiba and Fujitsu Ltd. The report called STC's 7600, with shipments expected in the first quarter of 1985, the most ambi-

See DISKS page 86

SHOP TALK
Terry Long

Distinctions blurry between system types

The distinctions between types of computer systems is getting more and more blurred. These days, the way a system is marketed can sometimes be the only way to determine into which category it fits. For example, one vendor's supermini may be equivalent to another's low-end mainframe. Supermicros are meshing with the low end of the minicomputer range.

Some vendors, such as many minicomputer vendors, have targeted their products to a particular market niche. But sometimes, a market niche can be broadly defined, such as general-purpose systems. This appears to be the target

See TARGET page 84

Long is a project leader at AT&T Information Systems in Altamonte Springs, Fla.

Lab director predicts use of 1M-bit chips by 1987

By Charles Babcock
CW New York Bureau

UNIONDALE, N.Y. — The director of an IBM semiconductor laboratory said integrated circuits will shrink below the one micron level by 1989 or 1990, and 1M-bit memory chips may appear in workstations as early as 1987.

Cmos technology is "clearly going to be the technical choice for the future," ahead of gallium arsenide or other exotic circuits, he added.

Nicholas M. Donofrio, director of the 1,800-employee, Essex Junction, Vt., lab, which is part of IBM's General Technology Division in Burlington, Vt., told 50 members of the American Electronics Association recently that the opinions he expressed were his own, not his company's.

Donofrio was instrumental in developing the fabrication process for IBM's 64K-bit memory chips. IBM is now shipping 256K memory chips and has produced its first experimental 1M-bit chips.

He predicted 1M-bit chips are less than three years away from production, and 4M-bit memory chips will come into use as early as 1992.

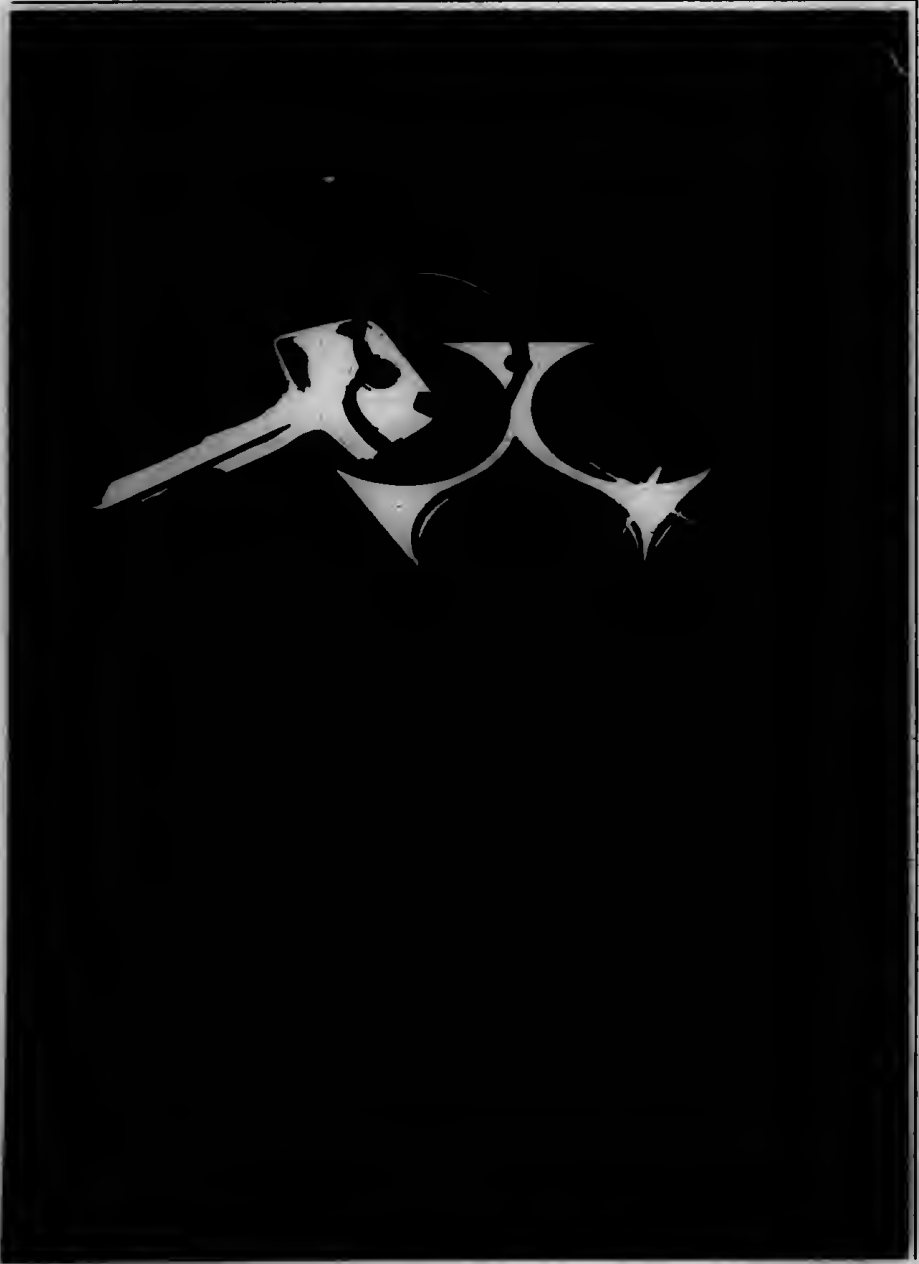
When Donofrio joined IBM 17 years ago, main computer memory cost $250,000 per megabyte. Today it costs $5,000 per megabyte, he noted. Computer users have "an insatiable appetite for memory," he added, and the number of bytes per system has gone up an average of 23% a year.

Donofrio predicted that low-power, densely packed Cmos chips will eventually replace the bipolar semiconductors currently in widespread use. Bipolar chips are faster than Cmos chips but cannot be packed with as many components and have heat dissipation problems, he explained. Cmos has already started to displace bipolar technology in logic circuits, he said.

Donofrio said there has been too little investment in developing gallium arsenide for it to come into widespread use as a semiconductor before 1990.

And while some claim Cmos chips operating as superconductors at 4 degrees Kelvin could be the next technological advance, Donofrio said he refused to believe it. "I have never found a cheap refrigerator," he said, noting that the cost of supercooling offsets the gain in speed.

Donofrio also said it was unlikely that wafer-scale technology, such as that attempted by Trilogy Ltd., was a practical alternative. Many interconnect problems exist at the wafer level that "get out of control very quickly." But growing the chip size and putting more components on each chip was a likely alternative, he said. IBM's 256K chip is 50mm compared with 15mm to 20mm for the 64K chip.



Genigraphics terminals aid graphics design

LIVERPOOL, N.Y. — Genigraphics Corp. has announced three terminals, based on Digital Equipment Corp. microcomputers, for use in designing high-quality presentation graphics for 35mm slides, view graphs and transparencies. The terminals are the SG1, 100D-Plus and SG2.

The SG1 is based on the DEC Micro/PDP-11/73 with 512K-byte main memory, the RSX-11M operating system, 31M-byte Winchester disk drive and dual 5¼- and 8-in. floppy disk drives. The SG1 comes with an ergonomically designed display with 576- by 768-line resolution.

The SG1 also comes with a palette of more than 16 million colors, three-page artwork with 256 colors per visual and 12 fonts. A communications feature enables users to transmit graphics to Genigraphics film recorders for production as 2,000- by 2,000-line or 4,000- by 4,000-line slides.

The price for SG1, with 12 fonts, Drawing Tracing Feature software and Extended Artwork software, is $95,000, the vendor said.

Six-font model

The 100D-Plus, also based on the Micro/PDP-11/73, comes with six fonts, and the Drawing Tracing Feature is optional. The product also features 5¼-in. floppy disks. Other features are said to include continuous control of hue, chroma, value, size and position; automatic justification; continuous zoom; automatic data plotting for pie, line, bar and area graphs; and file management for reading, writing, adding, reviewing and copying records. The price for the 100D-Plus is $72,000, vendor said.

The SG2, based on the Micro/PDP-11/23+, is offered with a 512K-byte main memory, 10M-byte Winchester disk drive and dual 5¼-in. floppy disks. An 8-in., single-drive floppy is optional. The price for the SG2 is $35,000, the vendor said.

All of these products are scheduled to be available in December 1984, according to the vendor.

More information is available from Genigraphics, 4806 W. Taft Road, Liverpool, N.Y. 13088.

Lisp compact announced

LOS ANGELES — Lisp Machine, Inc. has announced Lambda/E, a compact Lisp machine designed for expert systems and artifical intelligence software development. Lambda/E is the seventh member of the company's family of Lisp machines.

Lambda/E reportedly features a 32-bit Lisp processor, 128M bytes of virtual address space, a 17-in. 1,024-by 808-pixel monochrome display, 2M bytes of physical memory and 140M bytes of hard disk memory.

Other options include memory boards, a 60M-byte cartridge tape drive and an interface to the Ethernet local-area network.

Lambda/E costs $52,500, the vendor said. Deliveries are scheduled for the second quarter of 1985.

More information is available from Lisp Machine, located at 6033 W. Century Blvd., Los Angeles, Calif. 90045.

TURNKEY SYSTEMS

OPTICAL BUSINESS MACHINES, INC.
Dataflex

Optical Business Machines, Inc. has announced a supermainicomputer-based system called Dataflex, built around the Perkin-Elmer Corp. Series 3200 superminicomputer.

Dataflex is intended for sophisticated, time-sensitive applications in commercial and government environments, according to the vendor. Typical Dataflex applications are said to include piecework payroll, time and attendance recording, subscription fulfillment documents, turnaround billing applications, surveys and various typewritten documents.

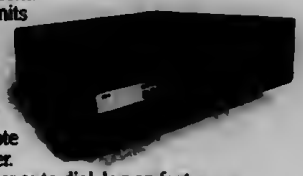
The 3200 reportedly has the capability to process multimedia data input from optical character readers (OCR), bar-code wands, hand-held OCR wands and direct data capture equipment such as cash registers, electronic meters and instrumentation devices under applications software control. Another feature in-

Continued on page 88

For accurate communications revved up to 2400 bps, you need an expert in the driver's seat: DataComm 2412.

In the race for the fastest, most accurate communications here's a sure winner: the new DataComm 2412 full duplex dial-up modem.

The DataComm 2412 really knows the road. It transmits miles of information in record-breaking time. It speeds error-free data over switched networks at 2400 bps – twice as fast as 212 modems. And because transmission time is cut in half, it dramatically reduces phone costs.



At accelerated speeds, DataComm 2412 can access packet switching networks, graphics terminals, and remote databases. It can also link minis to a mainframe computer.

Features of the DataComm 2412 include: a 30-number auto dial, log on feature; an auto adaptive equalizer; and an optional plug-in ARQ module that automatically detects, corrects and assures error-free data.

To put your communications on a faster track, rev up to 2400 bps. With the new DataComm 2412. For information about this, or any of the other winners on the GDC team, contact our Sales Department, General DataComm Industries, Inc., Middlebury, CT 06762-1299, (203) 574-1118.

general dataComm

general dataComm
Middlebury, Connecticut
06762-1299
Telephone: (203) 574-1118

For more information, contact your GDC Sales Office.

U.S. BUSINESS USER SALES OFFICES
Atlanta, GA (404) 935-0682
Boston, MA (617) 366-3600
Chicago, IL (312) 298-4181
Dallas, TX (214) 980-0803
Detroit, MI (313) 540-4110
Santa Ana, CA (714) 957-0244
New York, NY (212) 423-5080
San Francisco, CA (415) 569-3115
Washington, DC (301) 596-0888

U.S. TELECOMM SALES OFFICES
Atlanta, GA (404) 936-1793
San Francisco, CA (415) 932-0703
Cherry Hill, NJ (609) 751-1047
Chicago, IL (312) 355-8840
Middletown, NY (914) 343-2882
Dallas, TX (214) 241-5383
Denver, CO (303) 972-8875
Yonkers, NY (914) 969-5162
St. Louis, MO (314) 256-0062

GENERAL DATACOMM INDUSTRIES (CANADA) LTD
Headquarters – Suite W410
2255 Sheppard Ave East
Willowdale, Ontario
Canada M2J 4Y3
(416) 498-5100
TELEX: 06966619

Sales Offices –
Ottawa, Ont. (613) 741-8014
Montreal, Que. (514) 336-5454
Edmonton, Alta. (403) 483-4745
Vancouver (604) 430-5772

INTERNATIONAL SALES OFFICES
For the name of your distributor in the United Kingdom, Europe, Africa, and the Middle East, please contact:
General DataComm International
Molly Millars Close
Molly Millars Lane
Wokingham, Berkshire
England RG11 5QF
Telephone: 44-734-793600
Telex. 851-847298

For the name of your distributor in Asia, the Pacific, and Latin America, please contact: General DataComm International Corp., Middlebury, Connecticut 06762-1299
Telephone: (203) 574-1118

TARGET from page 81

market for IBM's Series 1 and Digital Equipment Corp.'s VAX-11/780.

Machines may be targeted for scientific or commercial applications, as are the Hewlett-Packard Co. HP 1000 and HP 3000, respectively. Some minis are positioned for specific applications like laboratory instrument data collection, manufacturing, robotics, medicine or office automation.

Matching the application

While a general-purpose machine is generally a safe choice, it may not be the one most suited to a particular application, nor the most cost-effective. Scientific machines are classified as such for their number-crunching ability and support for laboratory devices. They are appropriate for applications that have a tendency to become CPU-bound, such as statistical modeling, simulation and research applications.

Commercial machines are noted for their capacity to handle transaction processing or I/O-bound operations and perform well for such applications as billing and inventory. Machines targeted for business applications may come bundled with application-specific software or equipped with specialized hardware interfaces. Third-party vendors offer minicomputers packaged as turnkey systems that they will maintain and update.

The goal of any data processing application is to meet users' needs. This is only possible when the hardware and software used for the system are equal to the job. Hardware and software that fit the applications for which they were intended are also a real morale boost for system programmers and analysts. The only way to prevent such a catastrophe is to know the application and the hardware well.

The following are some suggestions that will help to determine whether a particular machine meets particular requirements.

■ Identify current application requirements in terms of the maximum number of concurrent users, required response times, size of the largest data base, size of the largest disk file, size of the largest program, interface requirements to other hardware and required software such as compilers, utilities and vendor-supported application packages. Be sure that the application planned for the minicomputer is not really a job for a mainframe.

■ Project the growth of the application. Does the vendor offer upward compatibility or will the choice to be made now imply a costly conversion in the future?

■ Compare the functionality with cost. Know what is available on the market that meets the requirements.

■ Know the training requirements for users and DP personnel. Calculate the costs in terms of time and money. If possible, match the machine software to the skills of existing personnel. Users generally are more satisfied if they can solve some of their own DP problems rather than contribute to the existing application backlog.

■ Consider the level of vendor support required and whether the vendor will be able to provide it. A vendor's reputation for support is not always consistent across all geographic locations. If you are running a 24-hour-a-day operation and production is dependent upon the uptime of the machine, be sure that you can depend on the vendor for parts and service 24 hours per day.

■ When you have narrowed your choice to several pieces of hardware, request a benchmark. Benchmarks do not necessarily have to be difficult to construct. In lieu of a benchmark, ask the vendor for references of companies that are using his equipment in a way similar to the one in which you plan to use it.

■ Does the system meet all or most of the requirements? Are the needs that it does not satisfy noncritical to the applications? One way to decide this is to prioritize the requirements in categories.

■ Can the vendor meet the delivery date? Will the machine be installed soon enough to meet the company's business needs? The second or third best machine in terms of meeting the requirements may turn out to be the optimal choice if the vendor of first choice cannot respond to needs quickly enough.

■ Do not choose a computer system because of a positive bias for a favorite vendor. Blindly purchasing from a familiar vendor may not always result in the effective solution of a business problem.

■ Do not take sales brochures at face value. A system that is advertised to support 30 users may support only 15 under certain types of applications.

■ Do not use a vendor demonstration of a machine as a benchmark. Demos are designed to show only machine strengths. The best benchmarks are those that most closely approximate the job mix that will be running once the machine is installed in house.

The best overall view of machine performance will come if the benchmark is run in four phases. First, run all the jobs single-threaded on an unloaded machine. Second, run a mix of the jobs that represents the average machine load. Third, run a mix of jobs that would represent an extremely heavy load. Fourth, run as many jobs as are required to bring the machine to full-load capacity. Then compare the results of step four with figures for projected growth to estimate the lifetime of the machine.

Vendors generally have software to simulate any number of users and can help in constructing a script that will represent a particular machine load. They may be able to provide performance statistics as jobs run.

IT'S 11 P.M.
DO YOU KNOW
WHAT YOUR VAX IS DOING?

on your VAX like never before.

You need to know exactly how your VAX computer is being used. Who uses it. On what projects. For how long. And especially, at what cost.

PACS PLUS tells you everything. With startling ease. Precision. Simplicity.

It's the only VAX/VMS cost control software that lets system managers select, examine and edit resource data via on-screen forms and simple keyped commands.

It has an incredible report writer that allows multi-level reporting on up to 30 system variables, including node, account, project, user, session, image, etc. These reports can be used to assess system performance and simplify capacity planning.

Our original PACS™ system accounting software is found in more than 800 locations throughout the world. It's won an ICP Million Dollar Award and is even sold by DEC itself. In fact, we're the leading independent developer of VAX/VMS software.

Find out what PACS PLUS can do for you. Call our toll-free number for a free information kit. Learn how, for only $3900, you can get control of your VAX. Call today. It could be later than you think.

Sil Signal Technology Inc
5951 Encina Road • Goleta, CA 93117 • (805) 683-3771
Call toll-free (800) 235-6787
VAX, VAX/VMS and DEC are trademarks of Digital Equipment Corporation

If you're reading someone else's Computerworld, cut it out.

☐ **Yes!** Please send me *Computerworld* for one year at $39 (that's $5 off the annual subscription rate of $44) plus all 10 COMPUTERWORLD FOCUS issues at no extra charge. I understand that my satisfaction is guaranteed and that I may cancel at any time and request a refund on the unused portion of my subscription.

First Initial Middle Initial Last Name

Your Title

Company Name

Address

City State Zip Code

☐ Bill me.
☐ Payment enclosed.
☐ Charge to my credit card.
☐ AmEx ☐ BA/VISA ☐ MC

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

(MC Only-List four digits above your name.) ☐☐☐☐

Expiration Date _____

Signature _____

If you are using a credit card, you can enter your order by calling TOLL-FREE: 1-800-343-5730!
(In Massachusetts, call collect: 617-879-0700.)

Address shown is: ☐ Home ☐ Business

☐ Check here if you do not wish to receive promotional mail.

Please indicate your business, title, and computer involvement below. Circle one number in Categories 1 and 2 and all that apply in Category 3.

1. BUSINESS/INDUSTRY
   End Users
   10. Manufacturer (other than computer)
   20. Finance/Insurance/Real Estate
   30. Medicine/Law/Education
   40. Wholesale/Retail/Trade
   50. Business Service (except DP)
   60. Government — State/Federal/Local
   65. Public Utility/Communication Systems/Transportation
   70. Mining/Construction/Petroleum/Refining
   75. Other User _____ (Please Specify)
   Vendors
   80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   85. Computer Service Bureau/Software/Planning/Consulting
   90. Computer/Peripheral Dealer/Distributor/Retailer
   95. Other Vendor _____ (Please Specify)

2. OCCUPATION/FUNCTION
   11. President/Owner/Partner/General Manager
   12. VP/Assistant VP
   13. Treasurer/Controller/Financial Officer
   21. Director/Manager/Supervisor DP/MIS Services
   22. Director/Manager of Operations/Planning/Admin. Serv.
   23. Systems Manager/Systems Analyst
   31. Manager/Supervisor Programming
   32. Programmer/Methods Analyst
   35. OA/WP Director/Manager/Supervisor
   38. Data Comm. Network/Systems Mgmt.
   41. Engineer/Scientific/R&D/Technical Mgmt.
   51. Manufacturing Sales Reps/Sales/Marketing Mgmt.
   60. Consulting Management
   70. Medical/Legal/Accounting/Management
   80. Educator/Journalist/Librarian/Student
   90. Other _____ (Please specify)

3. COMPUTER INVOLVEMENT
   Types of equipment with which you are personally involved either as a user, vendor or consultant (circle all that apply).
   A. Mainframes/Superminis
   B. Minicomputers/Small Business Computers
   C. Microcomputers/Desktops
   D. Communications Systems
   E. Office Automation Systems

Satisfaction Guaranteed On Paid Subscription:

I understand that I may cancel my subscription at any time (discontinuing the bonus issues), and request a full refund of the unused portion of my subscription.

Fill in and return to: 375 Cochituate Road, Box 897, Framingham, MA 01701

A PUBLICATION OF CW COMMUNICATIONS

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

146

DISKS from page 81

tions of these. The 7600 subsystem has a transfer rate of 3M byte/sec, the same as IBM's 3380 magnetic disk drive, the report said. STC has identified an optical storage market in data bases that are infrequently or never updated, such as stock market history and legal files, as well as a market for replacing magnetic tape for archival storage, according to the report.

Delivery of 7600

Despite the recent announcement that STC has filed for a reorganization under Chapter 11 of the Federal Bankruptcy Act, the company still plans to release the 7600 on schedule, according to an STC spokesman.

Technology for the erasable optical disk is making progress, the report stated. Most development programs involve either use of a low-power laser to change the state of an amorphous gadolinium coating on a disk or use of a polarized light to change a different type of amorphous coating from a crystalline state to a noncrystalline state.

But the first volume shipments of erasable optical disk drive systems may take another three to five years, because no firms have yet committed the heavy investment required, the report said.

Despite the loss of credibility after the 1981 departure of National Semiconductor Corp., Texas Instruments, Inc. and Rockwell International Corp. from the magnetic bubble memory market, the bubbles "now look like a product with a future, " the report stated. Portable computers offer the largest potential market because the bubbles have the advantages of physical size and durability while being transported, the report suggested.

Bubble memories are also attractive in applications such as industrial control systems, robots, point-of-sale terminals, medical instrumentation, avionic systems and militarized systems, according to the report.

Other highlights

Other highlights of the report were the following:

■ The most likely product to replace certain rigid disk drives is the high-capacity flexible disk drive, the report stated. The 3.3M-byte, 5¼-in. floppy media being shipped by Drivetec, Inc. and Eastman Kodak Co. are developing markets with specialized systems and as personal computer add-ons, according to the report. And such media may double its capacity to 6.6M bytes next year, with the potential for even more expansion.

■ Perpendicular recording for flexible disks has the potential to increase the capacity of a 5¼-in drive to 5M to 10M bytes, the report said. Linear densities of up to 50,000 bit/in. are predicted, but media availability will be a limitation on the market.

■ The use of very small magnetic particles could result in isotropic magnetic recording, in which more flux changes per inch can be obtained. Eastman Kodak's Spin Physics subsidiary is advocating this technology, the report stated.

■ The potential is great for track/in. improvements. "The industry still has plenty of room for innovation in this area," the report said, since most disk drives operate below 500 track/in., and the highest performers operate at approximately 960 track/in. The report predicted that IBM will release a double-density version of the 3380 in the first half of 1985, with at least 1,400 track/in.

■ Perpendicular recording, as opposed to longitudinal recording used by all disk drives today, has untapped potential. If magnetization were oriented in a plane perpendicular to the recording surface, the potential would be at least 100,000 bit/in., the report said. The Japanese are developing perpendicular recording, and CDC in the U.S. has a license for the technology.

The report on rigid disk drives, which is designated Volume I, is available for $1,015, and a report on flexible disk drives, Volume II, is available for $775. The price for both reports is $1,530. More information is available from Disk/Trend, Suite B-20, 5150 El Camino Real, Los Altos, Calif. 94022.

HARRIS from page 81

color combinations, the company said. Six planes of display memory for 64 color combinations are standard in the HS-20.

The independent graphics processor is a Motorola 68000 microprocessor with 128K bytes of random-access memory. Each one uses high-speed direct memory access transfer to obtain graphics commands from any area within the system's memory.

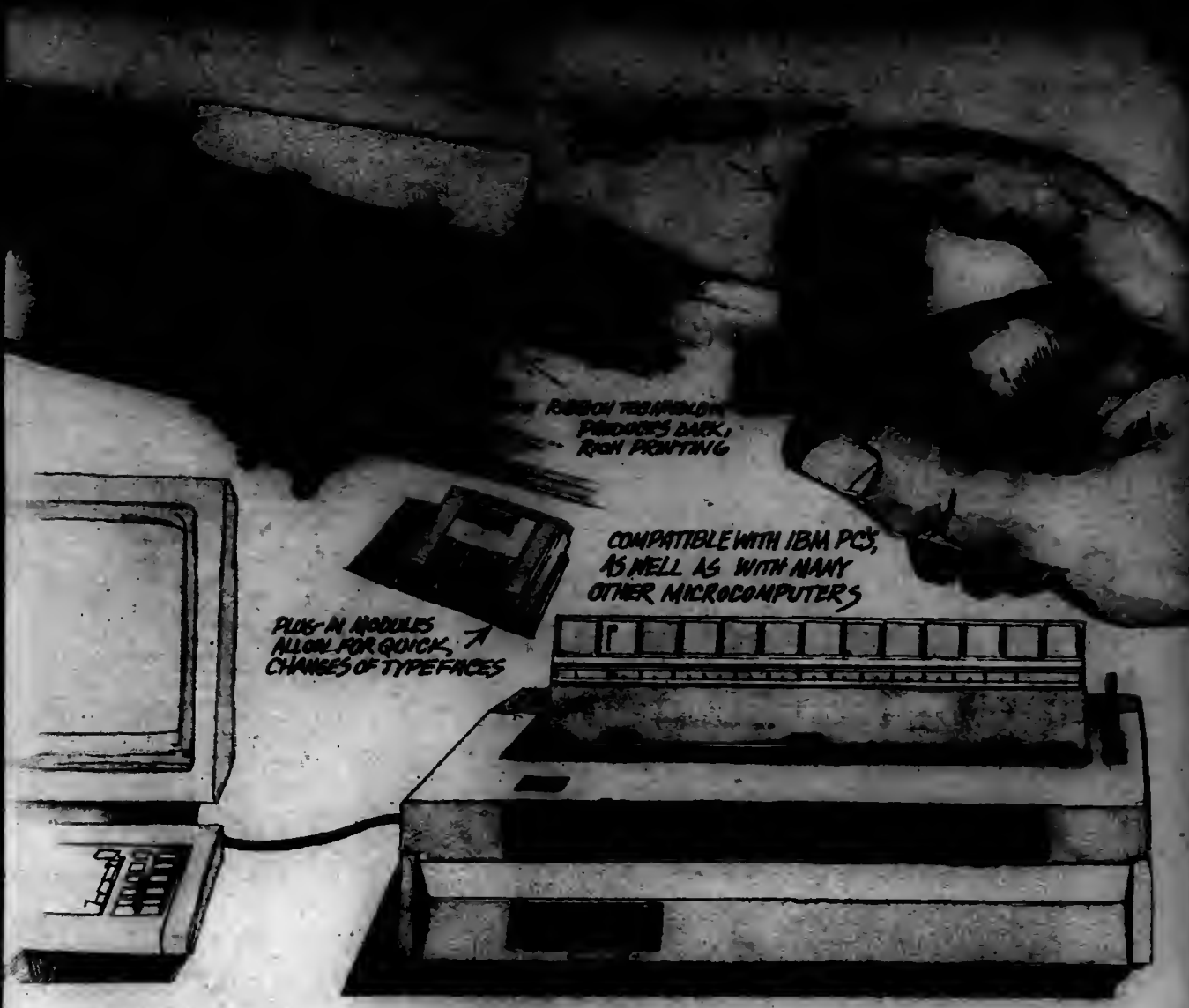
Computer-aided engineering applications include two-dimensional drafting and three-dimensional design, printed-circuit board layout and routing, VLSI circuit and gate-array design, civil engineering architecture and mapping, the company said.

A stand-alone unit includes the 32-bit CPU with three RS-232 lines, 1M-byte of memory, independent graphics processor, a 50M-byte disk drive and 45M-byte cartridge tape, AT&T's Unix with Fortran 77 and C languages, 19-in. monitor and an 8-slot chassis.

The standard HS-10 includes a monochrome graphics subsystem with a 19-in., 1,024-pixel by 800-pixel monitor. The HS-20 features color graphics with a 19-in., 832-pixel by 600-pixel monitor, the company said.

Prices for the HS-10 start at $32,500, and prices for the HS-20 start at $39,000.

More information is available from Harris, Computer Systems Division, 2101 W. Cypress Creek Road, Fort Lauderdale, Fla. 33309.



The new IBM Quietwriter® Printer. When letter quality should be seen and not heard.

If you're looking for a printer for your personal computer that offers quiet, letter-quality printing, look at—and listen to—the IBM "Quietwriter" Printer.

It's a technological breakthrough, featuring a new and innovative system for transferring ink to paper that makes it whisper-quiet.

But more than quiet, the "Quietwriter" Printer gives your letters the crispness of an IBM typewriter along with the deep, rich gloss of a carbon ribbon. All at up to 60 quiet characters per second.

What's more, plug-in electronic modules support the full 252-character set of the IBM Personal Computer.

You can easily attach the "Quietwriter" Printer to IBM personal computers and to many other microcomputers.

The "Quietwriter" Printer is just one example of the more than 70 printer models we build. But they all serve a single purpose: To make your printing as effective as your processing. To give your work the finishing touch.

Contact your IBM marketing representative or call 1 800 IBM-2468, Ext. 90/3T, for the IBM Product Center or authorized IBM dealer nearest you.

IBM

IBM PRINTERS

The Finishing Touch

Continued from page 83

cludes input through manual key-entry terminals, the vendor said.

The price of the system is dependent on the hardware and software configuration needed by the customer, but it starts at approximately $100,000, the vendor said.

Optical Business Machines, 804 W. New Haven Ave., Melbourne, Fla. 32901.

TERMINALS

LIBERTY ELECTRONICS U.S.A.
Freedom terminal enhancements

Liberty Electronics U.S.A. has enhanced three of its terminals and cut the price of another terminal.

Liberty is now offering 14-in., 132-col. display options for its Ascii terminals Freedom 110 and Freedom 200 and for its Digital Equipment Corp. VT220-compatible Freedom 220 terminal, the vendor said.

Prices for the enhanced terminal options are $595 for the Freedom 110, $745 for the Freedom 200 and $845 for the Freedom 220.

The price for a Freedom 110 has been reduced from $595 to $545, the vendor said.

Liberty Electronics, 625 Third St., San Francisco, Calif. 94107.

DIPIX, INC.
Aries II

Dipix, Inc. has announced the Aries II mapping workstation for use with Intergraph Corp.'s Intergraph Computer-Aided Mapping System, said to allow users to integrate information from raster images with Intergraph graphics files.

The Aries II mapping workstation operates in three modes: tape-to-tape transfer of a graphics file in Intergraph's Standard Interchange Format from the Intergraph system to a stand-alone Aries workstation; Aries peripheral workstation interfaced to the Intergraph host Digital Equipment Corp. VAX-11 as a peripheral with direct transfer between the vector and raster data bases; and as a stand-alone Aries workstation networked to the Intergraph host allowing direct transfer of data and a distributed processing environment.

Aries II ranges in price from $35,000 in workstation mode to $100,000 as a stand-alone unit.

Dipix, Rivers Center, 10220 Old Columbia Road, Columbia, Md. 21046.

Boeing puts mainframe decision support on your desk with a difference you can see.

Now you can have large-scale decision support at your fingertips. Our Business Management Workstation combines the IBM® PC XT/370 with compatible mainframe power and our proven EIS® (Executive Information Services) software. The result is comprehensive, integrated decision support with mainframe capabilities — on your desktop.

Boeing takes another unique step, too. We equip every workstation with color graphics. You won't find this impressive capability on the standard IBM PC XT/370. It's one of the extras you get only from Boeing, an IBM Value-Added Dealer.

Of course, the PC XT/370 is itself an amazing machine. With its virtual memory capabilities, you can handle modeling and reporting locally. You can analyze and project events with expanded functionality previously reserved for only the largest computers. Yet you have the convenience and response of your own microcomputer.

Meanwhile, your decision support can take full advantage of mainframe capabilities. You can quickly access your data base on our MAINSTREAM® remote computing service with full compatibility. And you can easily transfer applications and files without the complications traditionally associated with micro/mainframe links.

The software expertise of Boeing and the most advanced personal computer ever offered by IBM are joined to give you unprecedented decision support . . . with solutions that are graphically visible.

For more information on our Business Management Workstation or the location of a sales office near you, call toll-free 1-800-447-4700. Or write BOEING COMPUTER SERVICES, M.S. CV-26-19B, 7980 Gallows Court, Vienna, Virginia 22180.

BOEING COMPUTER SERVICES A Division of The Boeing Company

Boeing Computer Services is an Authorized IBM Value Added Dealer for the IBM Personal Computer, PC XT and PC XT/370.
IBM is a registered trademark of International Business Machines Corporation. EIS and MAINSTREAM are registered service marks of The Boeing Company.

MICROCOMPUTERS

SMALL TALK
Eric Bender
CW News Editor

Comdex/Fall shows all

Like a national political convention, Comdex/Fall '84 dominated the local landscape, generated tremendous hoopla with a working minimum of true excitement and ended up by promising something for everyone.

Some highlights:

- This year's hottest desktop micros, the IBM Personal Computer AT and the Apple Computer, Inc. Macintosh, both received generous gifts of software and hardware add-ons from third-party suppliers.
- Lotus Development Corp.'s Jazz integrated package for the Macintosh, in beta form, looked impressive during brief semipublic showings. One potential drawback is the $4,000-plus price tag for Jazz and the required 512K-byte Macintosh with external disk drive.
- Lightyear, the decision-modeling package for the IBM Personal Computer introduced by Lightyear, Inc., also sparked a great deal of interest.

See COMDEX page 96

Traveling professionals to drive up portable use

By Kathleen Sullivan
CW West Coast Bureau

LAS VEGAS — By 1990, portable computers will play a more significant role in office automation functions as increased emphasis is placed on meeting the needs of the professional audience and automating the work of people who travel.

That was the assessment of Thomas Kinch, president of Micro Office Systems Technology, Inc., a Connecticut-based portable computer firm, who addressed a seminar on trends in the portable computer industry at Comdex/Fall '84, held here recently.

To date, the portable computer industry has focused on designing Microsoft Corp. MS-DOS and Digital Research, Inc. CP/M-based systems. But Kinch said that with developments in 32-bit Cmos microprocessor technology, the industry is "not far away from introducing [an AT&T] Unix-based portable computer."

By the late 1980s, Kinch said, briefcase-size portable computers will be able to support a Unix file server.

Stymied by design shortcomings

Gene R. Talsky, president of Professional Marketing Management, Inc., a Connecticut-based consulting firm, said the market acceptance of these hand-held machines has been stymied by a number of design shortcomings.

The screen technology used in hand-held systems, which relies on the use of LCDs, presents problems for users, Talsky said.

"If you use a portable with an LCD display for more than an hour to run a word processing or spreadsheet program, it gets very tiring," he said. Problems with glare and contrast on LCDs remain to be addressed, he said.

Weaknesses to disappear

But, according to Talsky, the weaknesses of briefcase-size portables will disappear next year.

In 1985, he said, these hand-held computer systems will be designed with advanced microprocessors, will feature better displays — including flat panels — and will provide increased memory and storage.

Lisa Williams, president of STM Electronic Corp., a California-based computer firm that sells transportable computers, said that AT&T's entry into the computer market had introduced a new factor in the industry, one that could signal a change in direction for other computer firms.

Williams said AT&T has the ability to become another industry standard setter. "Cloning IBM is not the only strategy," she concluded.

- Digital Equipment Corp. cut prices for its Rainbow microcomputer/90
- NCR Corp. announced a local-area network/91
- Alpha Software Corp. enhanced its four-function Electric Desk package/92

INSIDE

Software/92
Systems/94
Communications/94
Board-Level Devices/96

True Basic — from original Basic authors — gets graphics

HANOVER, N.H. — John G. Kemeny and Thomas E. Kurtz, creators of Basic in 1964, are gambling that graphics capabilities will lure current Basic users to True Basic, Inc.'s True Basic.

Last year, the authors of Basic formed True Basic, Inc. and announced plans to create a superior version of Basic. "We want to eliminate the babble of Basic," Kemeny stated.

The linchpin of their offering is its ability to support graphics. True Basic conforms to the proposed American National Standards Institute (Ansi) Basic and supports Ansi's Graphic Kernal System, a proposed graphics standard recently incorporated in a number of IBM graphics products [CW, Sept. 24].

Principal benefits that True Basic is said to provide include the ability to draw pictures without counting pixels and to recall pictures previously drawn, Kemeny said. Users reportedly can design graphs, charts, picture programs and animated displays that can be used in programs or stored in external libraries. Pictures can be changed, rotated and moved from one window to another.

The product, which combines an editor, compiler and interpreter, features English language syntax, sophisticated error-handling, on-line Help facilities, a full screen editor, windows, mouse support and programmed function keys, True Basic said.

Initially, the company is targeting educational institutes for the program. Kemeny claimed that True Basic, which requires 128K bytes of random-access memory, will be offered on a number of microcomputers, and programs written on one microcomputer can be easily moved to a second microcomputer.

The company has announced an IBM Personal Computer version with a shipping date of January 1985 and an Apple Computer, Inc. Macintosh version due in the second quarter of 1985.

True Basic costs $149.90. Addison-Wesley Publishing Co. will act as publisher, handling the two versions and related materials.

Addison-Wesley is located in Reading, Mass. 01807.

Spelling checker, text outliner introduced for Lotus Symphony

NEW YORK — For Lotus Development Corp., Nov. 12 was a day of product introductions, led by its debut of Jazz but also featuring the announcement of two software products for use with the firm's Symphony integrated package and a book.

The software products that bowed, a spelling checker and a text outliner, will each reportedly be priced at $139 and will be available in early 1985. The spelling checker, Lotus said, will allow users to compare words in a document against those in a master dictionary and will manually correct the word or choose from a list of alternative words. The text outliner, Lotus added, will allow users to switch from writing a text outline to editing the text itself. It reportedly will also create a table of contents automatically.

Also introduced was the "Lotus Guide to Learning Symphony," the first in what Lotus said will be a series of learning and application guides jointly produced by the Cambridge, Mass., software firm and the Addison-Wesley Publishing Co. The guide is priced at $22.95 and reportedly features 400 illustrations.

Lotus is located at 161 First St., Cambridge, Mass. 02142.

Corona unwraps desktop series said to be compatible with IBM

LAS VEGAS — Corona Data Systems, Inc. has announced an enhanced series of IBM-compatible desktop personal computers.

Corona's PC400 series features 640- by 400-pixel resolution, along with a 14-in. monitor. The systems reportedly provide users with the ability to run in IBM's medium and high 200-line-resolution mode or in Corona's 400-line mode, without an adapter card. Graphics adapters for the PC400 series are built into the motherboard, leaving an extra expansion slot free, Corona said.

Based on the Intel Corp. 8088 microprocessor, the PC400 series includes 256K bytes of random-access memory (expandable to 512K bytes); Microsoft Corp.'s MS-DOS and GW-Basic; Multimate International Corp.'s Multimate word processing package, and Comprehensive Software Support's PC-Tutor.

The series ranges from the Model 12, with one floppy disk drive, to the Model HD2, which includes one floppy disk drive and a 10M-byte hard disk drive. The Model 12 is priced at $2,650, and the Model HD2 costs $4,395.

Corona is headquartered at 275 E. Hillcrest Drive, Thousand Oaks, Calif. 91360.

Spreadsheets cited most used micro software

NEW YORK — Spreadsheets are the most widely used software packages among companies using microcomputers, a national survey has found. According to the National Association of Accountants (NAA), which sponsored the survey, more than 80% of the companies purchasing micros use spreadsheet software packages.

Most companies initially bought micros hoping to use them for budget and financial analysis applications, the survey said, but it noted that 64% of the respondents used word processing software; 37% had general accounting packages; and 36% used graphics packages.

The survey found that 47% of the respondents using spreadsheets used Lotus Development Corp.'a 1-2-3; 22% chose Software Arts, Inc.'s Visicalc; and 12% used Sorcim Corp.'s Supercalc.

Word processing packages

Of those companies that use word processing packages, Micropro International Corp.'s Wordstar is used by 33% of the respondents. Service industry firms use word processing packages most frequently, the survey said.

"Respondents ... were not as pleased with their word processing software selection as they were with their spreadsheet selection," according to the survey.

This may be because "most of the respondents held management accounting positions and ... do not have hands-on experience working with their word processing package."

Manual systems replaced

BPI Systems, Inc.'s General Accounting was the accounting package employed by most of the respondents, the survey said. General accounting software packages were purchased primarily to replace manual systems, according to the NAA survey. The financial sector (including banks, insurance companies, real estate firms and security brokerage firms) had the biggest users of graphics software packages, the survey said.

More than 80% reportedly used their graphics package for preparing illustrations in reports and documents, and 74% used it to prepare graphs and charts for company presentations.

IBM Personal Computers reportedly were the most used micros among those surveyed. Another system mentioned frequently was IBM's Personal Computer XT.

Majority have one micro

According to the survey, the majority of the participants had one micro and used it between 20 and 40 hours a week. Most said that both management staff and between one and three clerical personnel are trained to use a microcomputer.

Conducted in cooperation with Auerbach Publishers, Inc. of Pennsauken, N.J., the survey questioned about 500 manufacturing firms and financial service organizations employing more than 500 people and reporting annual revenue in excess of $100 million.

Answers were also received from service industry firms reporting annual revenues between $1 million and $9.9 million and with fewer than 100 employees.

Results of the survey are published in this month's edition of *Management Accounting*.

DEC reduces micro, memory, software prices

LITTLETON, Mass. — Digital Equipment Corp. has reduced prices on its Rainbow 100 and Rainbow 100+ personal computers, memory options and operating system software.

The system unit price of the floppy-disk-based Rainbow 100 with 128K bytes of main memory is now $2,415 — reduced from $2,750 — and the Rainbow 100+ with a 10M-byte hard disk is now $4,315 — reduced from $5,075, the firm said.

The price of the 128K-byte option has been reduced from $449 to $300, and the 256K-byte option has been cut from $895 to $695.

Prices for Digital Research Inc.'s CP/M 86/80 or Microsoft Corp.'s MS-DOS operating systems have been reduced from $275 to $95 each. The two systems can be purchased together for $175, the company said.

Keyboard and monitor prices remain unchanged, however. A typical configuration of the Rainbow 100 system with 256K bytes of memory, keyboard, monitor and choice of operating systems is now $3,380, compared with $4,044, while a similarly equipped Rainbow 100+ is about $5,289 — reduced from $6,369, the company said.

DEC is located at 146 Main St., Maynard, Mass. 01754.

Go ahead.
Ask it anything
in the world.

For years, Prime® computer systems have been helping companies find out what they need to know. Instantly. That's our idea of communications.

Find out how design engineers are going on your new product.

Compare operating costs of your various divisions, using up-to-the-minute data.

With a Prime network, your key people are plugged into your entire company. Authorized users can access any file, from any Prime system. Whether even knowing where the file is. Whether it's across the building or around the world. And Prime systems communicate with your corporate mainframe.

Phone management available

Packages to autodial, autoanswer, provide security and remote access

PALO ALTO, Calif. — Digital Pathways, Inc., has introduced a line of communications software that is said to allow an IBM Personal Computer XT to perform telephone answering functions.

The Soundware series of products include: Communicard, a voice communications card, telephone management software called Voicemate and programming software called Soundtools.

Communicard permits high-quality voice to be recorded on a hard disk, the vendor said. The card is said to require a half slot in the IBM PC XT or compatible card cage and to provide automatic Touch-Tone recognition.

Used in conjunction with Communicard, Voicemate reportedly provides an individual telephone management system with message greeting, message playback, phone directory with automatic dialing capability, password recognition, remote owner access for message playback and audit train, voice file transmission, Touch-Tone dialing and Touch-Tone decoding.

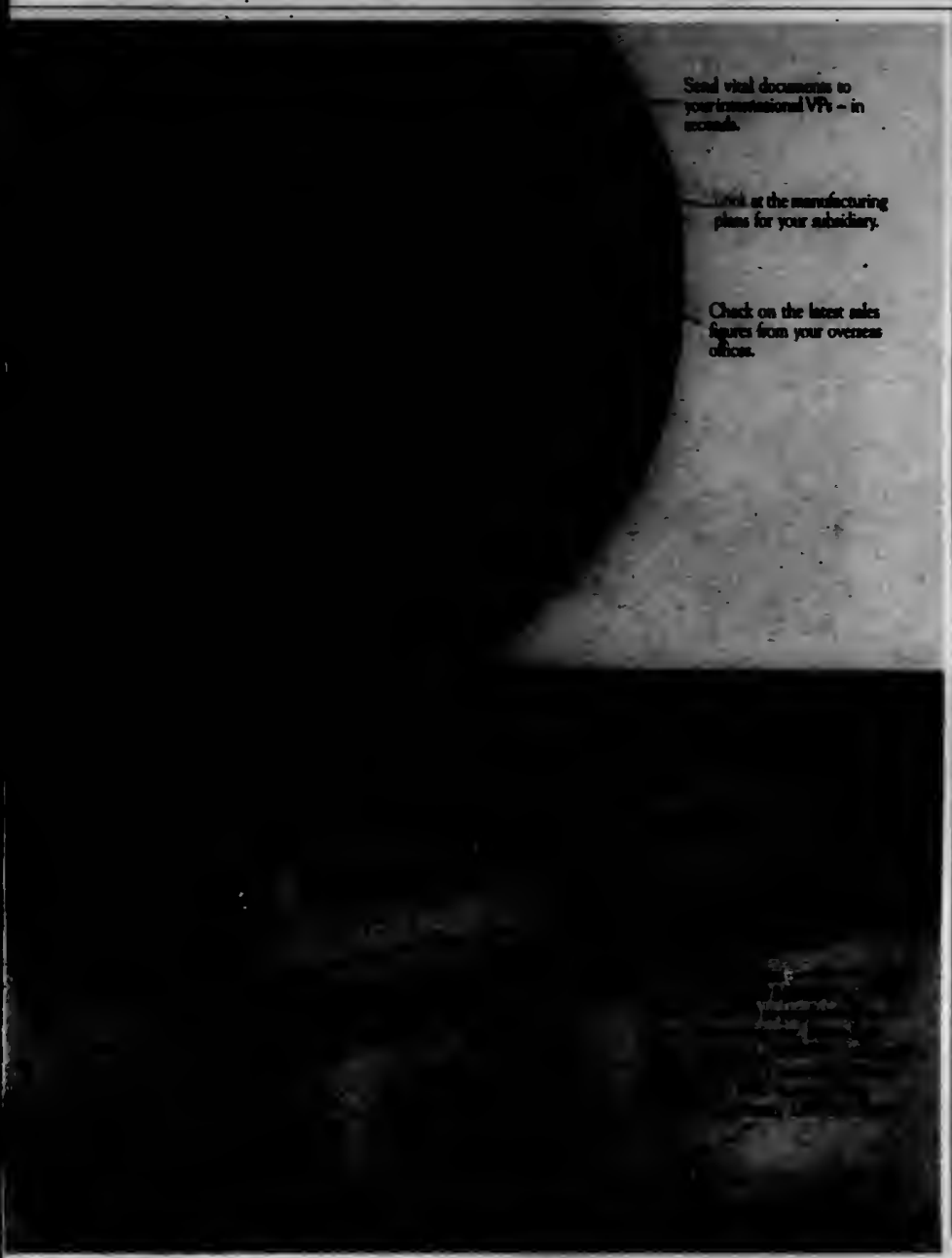
Voicemate includes a remote-access feature that allows the owner to call the personal computer and play back messages, the vendor said.

Soundtools reportedly allows users to develop their own software applications, including voice recording capabilities.

Price of the Soundware package, including Communicard, a diskette with Voicemate and Soundtools software, is $449.

The Communicard and Soundtools modules together sell for $329.

Digital Pathways is headquartered at 1060 E. Meadow Circle, Palo Alto, Calif. 94303.



Macintosh Think Tank announced

LAS VEGAS — Living Videotex introduced a version of its Think Tank outline processor for the 512K-byte model of the Apple Computer, Inc. Macintosh here this month at the Comdex/Fall '84 show.

Peter Winer, director of new product development for the Mountain View, Calif.-based software firm, said Think Tank for the large-memory Macintosh offers the capacity to store windows of text or graphics within a Think Tank outline, something not possible on earlier versions.

Think Tank lacks built-in graphics-generation capability, Winer said, but it allows graphics to be imported from any graphics program that runs on the Macintosh.

Like the other versions of Think Tank (for the Apple IIe, the 128K-byte Macintosh and the IBM Personal Computer) the new version of the software allows users to create an outline from notes and ideas entered in any order.

Winer pointed out that larger concepts are stored under main headlines and more specific concepts under smaller subheadlines, both created by the user.

A special feature of the 512K-byte Macintosh version, Winer noted, is its "slide show" function, under which users can place a series of graphics elements — including digitized pictures — back-to-back in a series and then run through them as if they were doing a slide show, with the machine's mouse acting as the remote control.

Think Tank for the 512K-byte Macintosh is priced at $245. An upgrade for users of Think Tank on the 128K-byte Macintosh is priced at $100.

Living Videotex is located at 2432 Charleston Road, Mountain View, Calif. 94043.

PC2PC links compatibles

DAYTON, Ohio — NCR Corp. has introduced PC2PC, a local-area network that links IBM Personal Computers and compatible computers.

The product transforms any micro on the network into a file server and allows up to 64 machines to be connected, NCR said. It is said to operate at a transmission speed of 1M bit/sec and to allow users to share printers, hard disks and communication lines.

"This product is user-installable and the entire network can be fully operational in less than two hours," Vernon W. Yates, NCR division vice-president and general manager, said. "It uses a small number of easy-to-use commands to allow the novice and experienced user to explore the capabilities of the network."

The cost of the network is $495 per connection.

NCR is located at 1700 S. Patterson Blvd., Dayton, Ohio 45479.

SOFTWARE

APPLIED DATA RESEARCH, INC.
ADR/PC Adroit enhancements

Applied Data Research, Inc. has enhanced ADR/PC Adroit, its training system software that runs on the IBM Personal Computer with IBM's PC-DOS operating system.

The product now is able to capture mainframe screens and create corresponding Adroit text screens, according to the vendor. To complete this task, a user requires a Digital Communications Associates, Inc. Irma board that is activated by the control key, Applied Data Research said. The enhancement reportedly expedites tutorial creation when combined with Adroit's software simulation capability.

Adroit costs $4,500.

Applied Data Research, Rt. 206 & Orchard Road, CN-8, Princeton, N.J. 08540.

PRECISION SOFTWARE PRODUCTS
Keys Please!

Precision Software Products has developed a product said to increase the speed of Micropro International Corp.'s Wordstar word processing package by 20% to 40%.

According to the company, Keys Please! puts all Wordstar commands onto function keys, and all printer capabilities are automatically activated. The product comes with an on-screen reference line and a chart of commands, eliminating the need to memorize Wordstar letter codes, the company said.

An Instant Install process enables Wordstar users to change peripherals to their computer systems without having to go through a Wordstar installation process.

Keys Please! with Instant Install is available with several operating systems, including Microsoft Corp.'s MS-DOS, IBM's PC-DOS, Digital Research, Inc.'s CP/M 80 and CP/M 3.0 and Musys Corp.'s Turbodos.

The cost of the product is $69.95

Precision Software Products, Suite 204, 360 17th St., Oakland, Calif. 94612.

STRATEGIC SOFTWARE PLANNING CORP.
Promis for the Personal Computer AT

Strategic Software Planning Corp. has announced that its project management software system is now available for the IBM Personal Computer AT.

Project Management Integrated System (Promis) can reportedly handle project planning, tracking, resource management and cost control functions. The product utilizes a data base architecture and report writing and graphics capabilities.

The cost of Promis is $2,995.

Strategic Software Planning, 222 Third St., Cambridge, Mass. 02142.

MANAGEMENT CONTROL SYSTEMS, INC.
Quick-Look Version 84.01; Financial Reporting System Version 2.01

Calculations for computing income tax averaging, 10-year averaging and marriage penalty deductions are among the enhancements included in Version 84.01 of Management Control Systems' (MCS) Quick-Look tax planner package.

The software reportedly runs on IBM's System/34 and 36, Personal Computer XT and AT and System/23.

Quick-Look Version 84.01 costs $535 for the IBM System/34 and System/36 computers. The cost of the software on the Personal Computer XT and AT is $350, and for the System/23, it costs $495.

The company also announced the MCS Financial Reporting System Version 2.01 for the IBM Personal Computer XT and AT.

The product increases processing time by eliminating the need for loading a key diskette in the disk drive, according to the company. Keyboard handling has also been modified to speed up data entry, the company said.

The package requires 256K bytes of memory and a 10M-byte hard disk, according to the vendor. It costs $3,500.

Management Control Systems, 2400 Lake Park Drive, Smyrna, Ga. 30080.

See TOOLS page 94

If your IBM PC repair service leaves you cold...

Warm up to
PC/RESERVE™
Anytime. Anywhere. On-site or overnite.

PC/RESERVE offers prompt, professional on-site service and support by more than 1100 technicians coast-to-coast. Optional blanket coverage can protect you 24 hours a day, 7 days a week.

Or, PC/RESERVE can replace your failed equipment with an identical unit. Overnite. Nationwide. Guaranteed, whether it's IBM or any number of compatible peripherals.

PC/RESERVE saves time and cold cash. We can design an on-site/overnite program that won't freeze your budget. If you don't want the cold shoulder next time your PC goes down, call PC/RESERVE today.

We support the IBM PC, IBM PC XT, IBM Portable PC, IBM PCjr, IBM 370 XT, IBM 3270 PC, IBM Personal Computer AT™ and many compatibles.

Anytime.
Anywhere.
On-site or overnite.

RTK
RT/KATIK™
Computer Services
215 Wood Avenue
Middlesex, NJ 08846
1-800-932-0448
Ext. 44

IBM is a registered trademark and IBM Personal Computer AT is a trademark of International Business Machines Corporation.

™ Trademark of International Business Machines Corporation.

Electric Desk gets upgrade

BURLINGTON, Mass. — Alpha Software Corp. has released an upgraded version of its Electric Desk, a four-function integrated package that runs on the IBM Personal Computer with IBM's PC-DOS operating system.

The new version reportedly supports spreadsheets up to 200K bytes in size, with improved speed in displaying spreadsheets. The upgrade also is said to add the ability to dial a phone number in the communications function without first creating a log-in script.

In addition, the enhanced Electric Desk can display foreign characters on-screen in the word processing mode, Alpha said.

Electric Desk runs with 256K bytes of random-access memory and provides word processing, data base management, spreadsheet and communications functions.

The upgrade will be provided free to current owners of the package. Electric Desk costs $345.

Alpha Software is located at 30 B St., Burlington, Mass. 01803.

SOFTWARE AG

The innovator sets the standard with perfect vision.

In the 1970's we developed a system to provide data independence—before there was such a thing as a relational data base.

Next, we introduced a high productivity programming language for developing applications in an on-line data base environment—before there was such a thing as a fourth generation programming language.

In both cases we anticipated a trend, and delivered a product to meet a need before it was even defined by the industry.

We didn't just stop there.

We recognized the importance of maximizing worker productivity at a time when others were concerned about the high cost of machines. That's why we are the first to present an integrated series of products that use the same language.

We identified the need for a high volume product for VAX machines—while most still considered the DEC-VAX equipment only for low volume, low capacity applications.

We saw the necessity of having many machines working in coordination and developed our family of networking products to support this trend.

We realized the requirement for true distribution of data, so we carefully integrated data communication capabilities with our data base software.

By listening to our users, we anticipated the growing importance of 24-hour-a-day access to data. As a result, we now offer the first nonstop data base.

Today, while others are busy putting labels on our innovations, we are quietly moving on to our next innovation. And, that's the proper plan for the world leader in advanced systems software.

How can you be sure that your company will be ready for the challenges of tomorrow? Call us today.

1-800-336-3761

SOFTWARE AG
ADABAS · NATURAL · COM-PLETE
Where the future comes as no surprise.

© 1984 Software AG of North America, Inc.
ADABAS and NATURAL are trademarks of Software AG of North America, Inc.
DEC and VAX are registered trademarks of Digital Equipment Corporation.
CW 1168

TOOLS from page 92

ANALYTICA CORP.
Reflex

Analytica Corp. has introduced Reflex, a data base management package for the IBM Personal Computer.

Reflex reportedly combines information management and analysis features and is designed for data collection and interpretation. It is said to perform traditional collection and retrieval functions. In addition, it facilitates analysis by allowing users to review information in a variety of formats and to group it to reveal interrelationships, trends and deviations, the company said.

Data reportedly can be organized in lists and tables, extracted and displayed in charts and graphs and summarized or combined using a number of built-in functions.

Reflex is said to require graphics capabilities and 384K bytes of random-access memory. It sells for $495.

Analytica, 3155 Kearney St., Fremont, Calif. 94538.

STERLING-CASTLE
The Decision Analyzer

Sterling-Castle has announced The Decision Analyzer, a decision-making software package for the IBM Personal Computer XT and compatibles.

The company said that up to five people can use the package, which reportedly makes judgments based on paired comparisons. The preferences of the decision maker on one or more criteria are combined into scores for each problem alternative or subject such as product preferences, plant sites, warehouse locations and personnel evaluations. Customers can then use the scores to determine the best course of action.

The package costs $199. Demonstration packages are being offered for $10.

Sterling-Castle, Suite 174, 702 Washington St., Marina del Ray, Calif. 90291.

LAYERED, INC.
Front Desk

Layered, Inc. has introduced a business calendar with a time accounting function for Apple Computer, Inc.'s Macintosh personal computer.

Front Desk integrates schedules in up to 15 categories, then reports or projects productivity and revenue per person or for an entire business, according to the vendor.

Front Desk can maintain employee schedules for up to 12 months and can provide time accounting information, the company said. Users can define standard hourly billing rates for each resource being scheduled. It reportedly uses the rates to calculate total revenue generated for each source.

Front Desk is priced at $149.95

Layered, 85 Merrimac St., Boston, Mass. 02114.

DURANGO SYSTEMS, INC.
RM/Cobol for Xenix 3.0

Durango Systems, Inc. has announced that Ryan-McFarland Corp.'s RM/Cobol compiler now runs on Durango's Poppy microcomputer series using Microsoft Corp.'s Xenix 3.0 operating system.

The company claimed that more than 1,500 application programs are available for RM/Cobol. RM/Cobol is now available on all Durango systems, which feature Intel Corp. 80186 and 80286 microprocessors and run Microsoft's MS-DOS and Digital Research, Inc.'s Concurrent CP/M 86 operating systems. The RM/Cobol compiler with runtime costs $1,250.

Durango Systems, 3003 N. First St., San Jose, Calif. 95134.

SYSTEMS

COMPUTER CONSOLES, INC.
CCI Personal Computer

Computer Consoles, Inc. (CCI) has introduced a desktop personal computer that is compatible with the IBM Personal Computer.

The CCI Personal Computer comes with Microsoft Corp.'s MS-DOS 2.11, Basic programming language and CCI's Officepower office automation terminal emulation package.

Hardware consists of a table-top terminal, tilt-swivel monochrome or color monitor, an Intel Corp. 8088 microprocessor, 256K bytes of of random-access memory (RAM) expandable to 640K bytes, two serial ports and a parallel port.

The desktop computer can operate as a fully supported Officepower terminal and can perform all of the OA system's functions, including integrated record and word processing capabilities, the company said.

Base price of the product is $2,500 for a single floppy disk drive, monochrome display, 256K bytes of RAM and Powerterminal emulation software. Prices range up to $5,800, depending on configuration.

Computer Consoles, 97 Humboldt St., Rochester, N.Y., 14609.

COMMUNICATIONS

AVATAR TECHNOLOGIES, INC.
PA-Plus

Avatar Technologies, Inc. has introduced a package for the IBM Personal Computer and Personal Computer XT that provides IBM 3270 terminal emulation capabilities.

PA-Plus is said to offer IBM 3278-2 terminal emulation for users requiring dial-in access to IBM mainframes.

The software is designed to be used in conjunction with the vendor's

Continued on page 96

TIME
Your Most Precious Resource

In any business, time is money! This is especially true when dealing with Data Communication Networks where system performance and RESPONSE TIME is critical to the user.

Degradation of system performance (responsiveness) is inevitable as customer work loads increase. Installing faster, more sophisticated hardware is a popular but temporary solution. It is only a matter of time until the problem reappears.

Questronics offers a solution through statistical performance analysis of your system. Over seventy-five categories of line utilization and response time information can be generated in eleven different reports (hard copy and/or data based).

Questronics model CPA/7 is setting the standard in the industry by providing vital performance statistics in the areas of:

- User/System Response Time
- Network Transmission Time
- Line Utilization
- Polling Counts
- Character Transmission Counts
- Poll List Wrap Time
- Transmission Errors
- Histograms
- Host Resident Time
- Alarm Conditions

Utilizing this information, DataCom managers can then make the crucial decisions necessary to fine tune and balance the network. Each line may also be further refined to greater efficiency, enabling planning and projection for new growth.

Call Questronics and discuss your situation on our TOLL FREE NUMBER 1-800-572-1122.

Answers through Analysis
QUESTRONICS INC.
3570 South West Temple • Salt Lake City, Utah 84115 • (801) 262-9923 • TWX 910-925-4000

And now . . .

The Perfect VSAM Solution.

NATURAL

For high-powered application development using VSAM files.

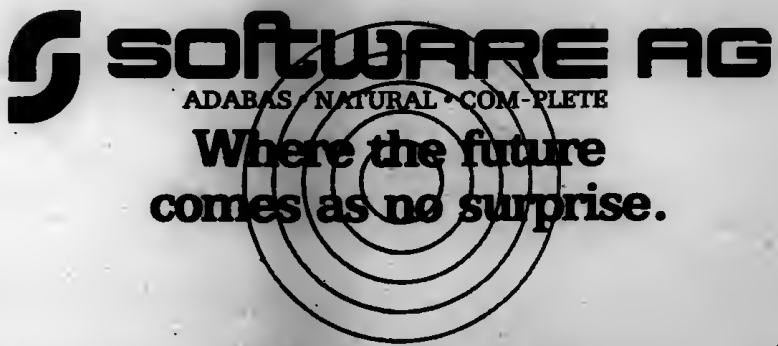
ADABAS/VSAM Bridge

For migrating VSAM-based applications to the power and flexibility of ADABAS.

At last there's a way for the organization with a major applications investment in VSAM to benefit from all the advantages of a relational data base, integrated fourth-generation language and data dictionary . . . with none of the time and expense associated with traditional conversion efforts!

At Software AG, each product in our integrated system grows naturally from the one before it, and all of our products speak the same language. And that's the proper plan for the world leader in advanced systems software. Call us today.

1-800-336-3761.



© 1994 Software AG of North America, Inc.
ADABAS and NATURAL are trademarks of Software AG of North America, Inc.

CW 1132

MICROCOMPUTERS

Continued from page 94

PA1000 or PA1000E protocol converters. These stand-alone units are said to allow dial-in access to both the 3270 network and a local or remote asynchronous host computer. PA-Plus provides keyboard and data management features included in the PA100 board-level emulation product, the vendor said. The product reportedly lets IBM Personal Computer users run 3270 asynchronous communications and IBM PC-DOS application sessions concurrently.

When used with PA1000 or PA1000E, PA-Plus is said to provide programmable keyboards with Help screen support, screen capture to disk or memory, multilevel password security and automatic logon.

PA-Plus costs $100.

Avatar Technologies, 99 South St., Hopkinton, Mass. 01748.

DATAPOINT CORP.
Intelligent Network Executive; PC8220

Datapoint Corp. has announced an adaptor card for the IBM Personal Computer AT that is said to enable the AT to function as an applications processor on a Datapoint Attached Resource Computer (ARC) local-area network.

The company also announced the PC8220, a software package that reportedly provides emulation of a Datapoint 8220 terminal.

The adaptor card, called the Intelligent Network Executive, is designed to fit in an expansion slot of the Personal Computer AT and is said to enable users to link their microcomputers via the Datapoint ARC intelligent network. The card is priced at $695.

The PC8220 emulation package reportedly enables an IBM Personal Computer to emulate a Datapoint terminal. Software support includes Datapoint's Resource Management System operating system. The product is priced at $175.

Datapoint, 9725 Datapoint Drive, San Antonio, Texas 78284.

PRINTERS/PLOTTERS/PERIPHERALS

TOSHIBA AMERICA, INC.
P1351 printer enhancements

Toshiba America, Inc.'s Information Systems Division has introduced an automatic sheet feeder and bidirectional tractor feed for its P1351 dot matrix printer.

The sheet feeder is capable of handling letter- and legal-size paper and can accommodate up to 170 sheets, including letterhead, the company said.

Using the bidirectional tractor, the printer reportedly can handle superscript and subscript for scientific notion with one and multipart forms.

The printer can accommodate bidirectional printing with both scripts without speed degradation, Toshiba said.

The sheet feeder retails for $995; the tractor feed is priced at $195, the vendor said.

Toshiba America, Information Systems Division, 2441 Michelle Drive, Tustin, Calif. 92680.

BOARD-LEVEL DEVICES

STRUCTURED SOFTWARE SYSTEMS, INC.
Mass-Storage ROM for HP 9825T

Structured Software Systems, Inc. has offered Mass-Storage Read-Only Memory (ROM) for the Hewlett-Packard Co. HP 9825T desktop computer.

The product reportedly replaces the HP 9822A Flexible Disk Drive ROM and 9895 8-in. double-sided drive. It is said to plug into one of the HP micro's four expansion slots in the same manner as the HP option ROMs.

The Mass-Storage ROM also interfaces to all Hewlett-Packard disks, including the 9221 and 9122 3½-in. microdiskette drives, according to the vendor.

The Mass-Storage ROM is priced at $600.

Structured Software Systems, Box 1072, Irick Road, Mount Holly, N.J. 08060.

There's A New Direction In Laser Print Technology

Introducing the QMS Lasergrafix™ 800

Now you can bring laser print technology right to your desk for all your business and industrial graphics needs. The Lasergrafix™ 800 from Quality Micro Systems brings full bit-mapped graphics capabilities down to true desktop size. And if you thought the flexibility, convenience and economy of laser print technology was priced over your head—look down—to under $10,000.

For letter quality word processing. Bar charts. Pie charts. Even barcodes. Full bit-mapped page memory lets you mix text and graphics, different letter sizes and type styles—all on the same page—even on the same line. The Lasergrafix 800's intelligent controller takes simple print commands through your normal data stream. So your computer's memory resources are free to do other important work.

And, QMS intelligent applications firmware is standard throughout our entire growing family of electronic page printers. So your Lasergrafix 800 can be part of a print applications master plan—a plan which can include the pioneering Lasergrafix 1200 for more continuously print intensive locations.

You get whisper quiet performance. So you can place a print workstation with the efficient printing speed of eight pages per minute, almost anywhere you need one. And the Lasergrafix 800 interfaces with just about any computer system you can name. So you can be up and running in no time—in the hottest new direction in the graphics field—down. With the Lasergrafix 800 from Quality Micro Systems. Ask for a demonstration today.

___ Send me the Lasergrafix 800 Information Packet, samples of mixed fonts, graphics and everything else it does.

___ Please contact me to arrange a demonstration.

Name: _____ Title: _____

Company: _____

Address: _____

Type of system you are now using: _____

Number of print workstations you are considering: _____

Prime applications for printer: _____

CW

QMS

QUALITY MICRO SYSTEMS, INC.

P.O. Box 81250 Mobile, AL 36689

Telephone (205)633-4300 Telex RCA 26-6013

WHERE IMAGINATION LEADS

COMDEX from page 89

■ Simple "pop-up" packages such as Borland International's Sidekick, offering handy and easily accessible features within other applications, were the programs that came up most frequently in casual conversation. "At last I really have a reason to use [a personal computer] every day!" one user remarked.

■ With IBM compatibility a standard for most serious personal computer manufacturers, vendors increasingly are attempting to differentiate themselves once again by adding communications or graphics features or by using value-added reselling strategies. In one example, ITT launched a personal computer, called the Voice Communications PC, which was aimed at integrating voice recognition, management and synthesis features into the company's Xtra.

■ Dozens of local-area network-related announcements were scattered throughout Comdex. Speaking almost as one, network suppliers insisted that IBM's PC Network and Microsoft, Inc.'s Networks/MS-DOS 3.1 have broken the ice on software application standardization. Copy protection and licensing for network-delivered software remain major stumbling blocks, however.

Quite likely, Comdex unleashed a thousand products on a grateful world, and every last one of them was described a thousand times in exactly the same way — as a customer solution.

COMPUTER INDUSTRY

STC credit plan canceled; 1,200 layoffs announced

By David Gomes
CW Staff

LOUISVILLE, Colo. — Storage Technology Corp.'s (STC) efforts to steady its tottering business were dealt a serious blow when Chemical Bank of New York recently decided to terminate a previously announced loan commitment.

The cash infusion was badly needed by STC, which last month filed for protection from its creditors under Chapter 11 of the Federal Bankruptcy Act.

STC, a maker of data storage devices, said Nov. 16 that Chemical Bank had terminated the loan agreement in which it would have provided STC with a $150 million credit line. The loan had been subject to a definitive agreement between the companies and approval from the bankruptcy court.

In the wake of that development, STC said last week that it was further reducing its work force by 1,200, with 1,100 of those positions being taken from its Colorado facilities and 100 at its Documation subsidiary in Palm Bay, Fla.

STC's board of directors also named one of its members, Thomas F. Wands, as interim president and chief executive officer (CEO). Jesse Aweida stepped down as CEO but remained as chairman of the board.

'[STC] can obtain sufficient short-term financing to operate its business until longer term financing issues are resolved.'
— STC statement

STC said it was negotiating with other financial institutions to obtain the cash it needs to operate while it reorganizes under Chapter 11. "The company believes that it can obtain sufficient short-term financing to operate its business until its longer term financing issues are resolved," STC said in a statement.

STC gave no explanation for why the loan was terminated. Ken Herz, a spokesman for Chemical Bank, said the company would not comment on the matter. Erica Rosenfeld, a spokeswoman for Touche

See STC page 109

Peachtree sale, demise refuted; retail sale eyed

Manager cites rebound, predicts profitable '85

By Kathleen Sullivan
CW West Coast Bureau

LAS VEGAS — When Larry Smart, general manager of Peachtree Software, Inc., took the podium at a Comdex/Fall '84 press conference here recently, he did not waste any time getting to the heart of the matter.

"It has been widely rumored that the purpose of this press conference was to announce the sale or shutdown of Peachtree Software," he said. [Management Science America, Inc. (MSA) had recently announced that Peachtree, its microcomputer software subsidiary, was up for sale.] "But the discussion of our death has been widely exaggerated," said Smart, who also serves as senior vice-president of MSA.

MSA, in conjunction with Alex Brown, a Baltimore-based investment banking firm, recently issued an "offering memoran-

See MSA page 109

■ The proposed merger with Visicorp solves funding problems for Paladin Software Corp. but also saddles it with restoring credibility to a tarnished product line, the president of Paladin acknowledged recently/106

■ Speaking of mergers, the recently announced absorption of Visual Technology, Inc. by Lee Data Corp. had been under discussion for two years, executives of both companies said recently/106

■ Financially ailing Eagle Computer, Inc. posted a loss for the most recent quarter but managed to sound cheerful anyway/106

IBM seeks mart leverage via customer revenue

By John Desmond
CW Staff

NEW YORK — Despite dramatic drops in hardware prices in the last 20 years, IBM's marketing strategy is to continue to increase its revenues from existing customers by selling them increasingly more powerful CPUs with more demanding software.

So said noted IBM consultant and author Fred Lamond, who spoke at a recent seminar here.

Lamond said the cost of main memory has dropped 600:1 in the last 20 years, based on the price for 1M byte of main memory on an IBM 2365 Model 2 in 1964 and on the same capacity for an IBM Personal Computer AT today.

To maintain revenues, IBM has had to sell its oldest customers on using 600 times the processing power, 200 times the main memory and 50 times the disk backup of 20 years ago, he said.

Lamond, who conducted a three-day seminar on alternative growth strategies for IBM users, addressed the issue of how the increased power is being used and whether users are really locked into the directions that IBM has mapped out for them.

Lamond

As IBM main memory has increased, operating systems have occupied greater capacities of main memory, Lamond noted. For example, the IBM OS/360 MFT operating system running on the IBM 360/75 occupied 80K bytes in main memory. The MVS/XA operating system running on the 3081 Model KX mainframe requires 4M to 8M bytes of main memory — an increase of 50 to 100 times, he said.

"That growth has not been done by simply adding lots of loops that don't do any work. IBM has added more functions," Lamond said. The functions added have allowed users to begin programming on-line instead of off-line and to execute instructions on-line instead of in batch mode.

Competition in the 1970s from minicomputer vendors such as Digital Equipment Corp. helped motivate IBM to aid program development, Lamond said. A 1975 survey that IBM commissioned showed that appli-

See IBM page 108

ACRS cuts, changes seen key to tax simplification

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

Generally believed to be supportive of President Ronald Reagan in the recent election, computer users and vendors may find the November ballot shockingly counterproductive to their own interests if recent reports out of Washington, D.C., are accurate.

In the traditional Washingtonian style of anonymous spokesmen and sources floating trial balloons to see how well they fly, recent press reports indicated that a key measure to any tax simplification proposal from the U.S. Department of the Treasury will be the modification or elimination of the Accelerated Cost Recovery System (ACRS).

ACRS is the bonanza tax write-down program instituted just a few years ago to substitute for the actual life depreciation method of writing off expenditures on tangible equipment and property.

Aside from election campaign rhetoric, just about anybody with a head on his shoulders must by now realize that the U.S. government needs some mechanism to relieve the astounding federal budget deficits being run up by the administration that came to town with the stated goal of shrinking the federal government.

With Reagan committed to defense spending, senators and representatives unwilling to touch popular entitlement programs and the growing federal debt taking an increasing bite just for interest payments, the moderate viewpoint is that some type of enhancements to the federal government's revenue collection are mandatory.

Because cutting ACRS is the first substantive trial balloon to be floated, it seems reasonable to conclude that flat-tax simplification is going to involve an attempt to remove what is probably the most admired, and arguably the most effective, business stimulation program in recent history.

It will affect computer industry vendors who need large amounts of capital in order to make rapid and expensive development plans to stay abreast of America's fastest moving industry. It will impact users who are now encouraged to replace older generation equipment because they can effectively recover the costs of purchase in five years. And it will impact the leasing indus-

See ACRS page 107

Lack of changes in 1984 tax act leaves credit status

OUTSIDE LINES
Alonzo D Saunders

Perhaps the biggest non-event of the Tax Reform Act of 1984 was that no changes were made to the rules regarding software development credits. The Internal Revenue Service code says that the costs of developing computer software do not automatically qualify as a research and experimentation credit. What qualifies is "new or significantly improved" software.

Consider the quandry of Lotus Development Corp. Its Symphony product, as currently envisioned under the law, is eligible for the credit. But what about a product like [Lotus] 1-2-3? Does "significantly improved" hinder taking the credit if 1-2-3 were to become [Lotus] 1-2-3-4? A software product line extension or a product that is compatible with another is likewise on uncertain ground.

Taking the credit has a direct impact on the balance sheet, because a credit is a deduction from taxes. As Robert Langer, treasurer of Lotus, put the problem, if the credit reduces the company's tax rate from 50% to 48%, then the company's earnings are correspondingly increased. So are earnings per share and the interests of financiers and capital markets in the company.

The downside is that if an IRS audit disallows the credit, the company may find itself restating earnings. Shareholders tend not to be pleased by a downward restatement. The Securities and Exchange Commission (SEC) position on this is well taken. Investors do not know at any given moment how hard a software development company's financials are unless the company voluntarily discloses whether its accounting treatment of the credit is aggressive or conservative. Ironically, there is not a specific accounting rule applicable under these circumstances to outline management discretion or circumscribe management greed.

The Department of the Treasury has offered some guidelines. Treasury distinguishes between software developed for in-house or "management" use and in-house, "innovative" software. The former would not qualify for the credit; the latter would. Treasury also disallows credit for "customized" software but not for software sold to the public without customization. These distinctions do not seem to have been made with marketing realities in mind, so they do not clarify matters. George Yost of Coopers & Lybrand has characterized

Saunders is a Boston-based attorney with a practice that includes international marketing, antitrust issues and corporate finance.

YOUR *SOURCE* FOR BEST PRICES
QUME
BIG CRT VALUES.
Qume's SPRINT 11 PLUS family of printers for every microcomputer.
Authorized Distributors of Terminals, Printers, Modems, etc.
• ADDS • ANADEX • CERMETEK
• DATAPRODUCTS • ESPRIT
• QUME and much more!
COMPUTER SOURCE International, Inc.
TEL: 516-348-7474

BEHIND EVERY SUC
IS AN M.I.S. DIREC

# of software development in state of confusion

Treasury's policy in January 1984's *The Tax Executive* as a "disincentive" to software development.

The Financial Accounting Standards Board (FASB) — the major rule-making body for accountants — has recently proposed a rule that would allow certain software development costs to be treated as assets. The SEC opposes this approach on the grounds that it creates instant profits and, as discussed above, does not address uniformity in software accounting. Nevertheless, the SEC will defer to FASB, and if the FASB rule is adopted, it would become effective in December.

Congress deliberated this law for over a year, coming up with an act in two parts: the Spending Reduction Act, designed to decrease federal spending by some $13 billion; and the Tax Reform Act, designed to raise some $50 billion.

Unlike previous revenue-raising acts, this tax act was not intended to change income tax rates either for companies or for individuals. Its objective was to increase revenue by closing loopholes. The act, therefore, made significant technical changes, changes that are more subtle and less likely to have their impact felt immediately. The act also promised additional regulations in many areas, as there are auditors, lawyers, treasurers and others who are waiting for additional shoes to drop.

As we have seen, however, Congress may have been myopic by not putting these loopholes in perspective and balancing them against other, nontax policies. The result — a continuing lack of a coherent federal tax policy for the high-tech industry.

If it is said that Congress is the culprit, then it must also be said in all fairness that Congress may have done its duty as it saw fit, if not very well. Yet in the final analysis, not Congress but the industry itself must take responsibility for laws that nurtured its fragile beginnings, compensated its people, protected it (and its customers) from theft, kept its finances honest and provided incentives to be competitive worldwide.

If change or prevention of laws, which some call penalties and others call disincentives, are to be made, then the high-tech industry should read the Tax Reform Act of 1984 as a call to arms: The industry must dramatically step up its relations with the public and its liaisons with Congress. It should devise a strategy to lobby at the federal level as never before.

First, the industry should attack the serious problem posed by the lack of clarity of the software development accounting rules. Second, the industry should develop a position that will counteract the inevitable and possibly onerous coming of future IRS regulations. Allies such as FASB, the Big Eight, legal counsel and public relations counsel should be involved.

In short, the Tax Act's errors and omissions demonstrated Congress' ignorance of the realities of the high-tech industry and, sadly, also demonstrated the industry's lack of clout in the corridors of Congress. Now that the industry has seen what can occur without political diligence, perhaps it will be motivated to get organized and step up the fight for its objectives.

CESSFUL BUSINESSMAN
TOR WITH CLOUT.™

"I JUST GOT THE BEST PRESENT A MANAGER COULD GET."

In most companies, there's one thing managers want even more than corporate perks or bigger staffs.

Information.

And they'll drive your whole DP staff up the wall trying to get it. They'll ask you to round up data that's scattered all through the company. Then expect you to sort it a hundred ways from Sunday. And deliver it last week.

Even worse, they'll buy carloads of PCs, then come running to you for help every time they forget how to plug one of them in.

But now, there's a way to give these global marketing heavies the answers they've been looking for. And give yourself a break at the same time.

All you do is take the mainframe data they want—and download it into their PCs, hard disks, or network servers. Then give every one of them a new software program called Clout.™ It's as simple as that.

"IT WRAPS UP FILES FROM LOTUS 1-2-3,™ PFS:FILE,™ DBASE II,™ THE MAINFRAMES, AND MORE."

In the past, it used to be near impossible to pull information together from different sources, without re-entering every bit of the data. But the new Clout takes data files directly from these popular programs—plus ASCII, DIF, and SYLK files, too. So users can get information from other PCs by sharing floppy disks. Or being part of a LAN. Clout can even read files that have been transmitted from the company mainframe. Or another PC.

Anytime users have a question, they just ask—in their own words! Clout will scan up to 40 of these files automatically, cross-reference five simultaneously, and there's the answer. They don't have to know exactly how the data is organized. Or even in which file it's stored. Best of all, Clout won't let these high-powered managers pollute the database. No matter how hard they try.

"NOW THE WHOLE DP DEPARTMENT CAN GET A CHRISTMAS BREAK."

Clout's self-guided, step-by-step tutorial makes learning so easy, your staff will spend less time training these people. And more time on the things they do best. Like figuring out ways to improve operations. And maybe, vacationing in the Bahamas this winter.

"GIVE YOURSELF A BONUS. GET A DEMO TODAY."

Clout's suggested retail price is less than $300—a small price to pay for a big boost in productivity. But if you prefer we'll send you a full demo of Clout for only $6.95 (plus shipping). Just call 1-800-547-4000, Dept. 926 in Oregon, or outside the U.S., call 1-503-684-3000, Dept. 926 Or get in touch with your nearest computer or software store.

And see what it's like to wield a little Clout.

CLOUT™
FROM MICRORIM®

Requires 256K of memory. Runs on MS-DOS and PC/DOS operating systems. Hard disk recommended.

VAX
• BUY
• SELL
• TRADE
AMERICAN

HOW TO NAME YOUR COMPANY

AMBI, COGNOS, COMPAQ, DAYRLO, MINDSET, SOFTRA... meaningful, memorable company names created by NameLab Inc.

How do we do it? By the same techniques we use to develop brand names for firms like Pepsico, Gillette, P&G and Honda.

Write or call for a free information packet.

NAMELAB®
Name Development & Testing Laboratory
711 Marina Boulevard
San Francisco, CA 94123
415-563-1639

COMPUTER INDUSTRY

IBM users question future

Integration, ambiguous solutions raise concern

CW AT ENTERPRISE INFO SYSTEMS

By Kathleen Burton
CW West Coast Bureau

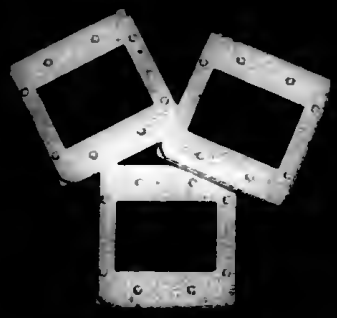
SAN DIEGO — Concerned IBM users, trying to plot their future strategies, are questioning the company about a number of wide-ranging issues, encompassing everything from ambiguous IBM solutions to a perceived lack of integration among IBM product families.

So claimed Robert T. Fertig, president of Enterprise Information Systems, Inc. at a seminar held at the sixth annual Enterprise Information Systems forum in San Diego recently. Using results from his annual survey of more than 200 IBM users, Fertig said other user concerns centered on IBM's nebulous operating system strategy, plans for the VM/CMS environment, questions about the direction of distributed data processing and dismay over IBM's rapidly skyrocketing support costs.

Based on the survey, Fertig predicted several IBM product and strategy scenarios through 1987.

- Unlike Digital Equipment Corp., IBM will avoid providing a total integrated office automation solution. DEC's OA solution lets users move from a Microvax I and II to clustered DEC 8600s using a single operating system. This strategy makes DEC's products an obvious target for plug-compatibles, and any price/performance improvements to low-end products must also be implemented at the high end.
- IBM's popular Professional Office Systems Software (Profs) will merge with the poorly performing Distributed Office System Support (Disoss) host-based business system by the second quarter.
- IBM will develop multiple solutions and overlapping products to answer mainframe server needs. The 8100 will be enhanced to act as a file and print server in a local-area network. The 8100, 4300, System/36 and System/38 will all serve distributed processing needs. This strategy will prove expensive and confusing for users but will let IBM offer a moving target to competitors.
- IBM will announce initial models of its next mainframe family, the Sierra series, with capacities of 7.5 to 30 millions of instructions per second perhaps as early as third-quarter 1985. Offering bulk main storage, the Sierra will adversely impact IBM's existing 3080Q and KX series, offering twice as much performance for the price. The Summit series, a sucessor to the Sierra, may be announced by the second quarter of 1987.
- IBM's mid-range System/38 will merge with the 4300 line by 1986 and serve as a key departmental and host system in IBM's OA strategy.
- An 80386-based update to the Personal Computer AT will be released in 1986. The AT will continue to run both MS-DOS and Xenix, underscoring IBM's strategy of offering several solutions and letting the market decide.
- Aimed squarely at the business/professional market, IBM will announce the Crackerjack portable computer, Fertig said, by this Christmas. The 80186-based, stripped-down model will run MS-DOS, retail for $1,500, weigh less than 15 lb, have a built-in 3½-in. disk drive and an attached plasma display.

Not just graphics...
Genigraphics presentation power you can afford.



DIGITAL BRINGS VAX TO LARGE SCALE COMPUTING.

INTRODUCING THE VAX 8600 SYSTEM.

Your applications can do exactly what you want them to on Digital's new VAX™ 8600 computer system. They can expand.

User population can increase. Scientific problems can become more complex. Transaction volume can intensify. And data storage requirements can grow exponentially.

The VAX 8600 system gives you unprecedented capacity for applications growth. It's the first of a new generation of large scale VAX processors, with memory expansion to 32 million bytes and online storage up to 160 billion bytes. Yet the VAX 8600 system maintains complete architectural compatibility with every other VAX processor – including the new desktop-size MicroVAX I™ system. Every system in the family gives you the same VMS™ operating system software, with the same set of proven development tools, communications options and data management facilities. Quite simply, there's not another computer family in the world that can match the growth path you get with Digital's VAX systems.

YOU GET UP TO 4.2 TIMES THE PERFORMANCE.

We've engineered the VAX 8600 system to deliver more than four times the processing speed and performance that the industry-standard VAX-11/780 system is known for. We've achieved this performance increase through the use of ECL gate array technology and several advanced engineering techniques.

Specifically, the VAX 8600 system incorporates four-stage pipelined processing that increases throughput by allowing the system to execute one instruction while it simultaneously decodes a second, generates an address for a third and fetches a fourth. There's also a floating point accelerator that speeds floating point operations.

Even with all its power, the VAX 8600 system conserves floor space. The CPU fits into the same size cabinet as the VAX-11/780 CPU. Power consumption and air conditioning requirements are similar, too.

VAX 8600 SYSTEM HIGHLIGHTS

MAXIMUM MAIN MEMORY SIZE 32 Million Bytes
MAXIMUM STORAGE CAPACITY 160 Billion Bytes
MAXIMUM COMMUNICATION LINES 512 plus Local and Wide Area Networks
PROGRAM ADDRESS CAPACITY 4 Billion Bytes
BUS SUPPORT Availability includes 6 UNIBUS,™ 2 SBI, 4 DR 780, 3 CI and 4 MASSBUS™
PHYSICAL DIMENSIONS 60½" x 73½" x 30"
POWER CONSUMPTION 6.5 KW (10 KVA)
AIR CONDITIONING REQUIREMENTS 22,200 BTU/hr
ACOUSTIC LEVEL 60 dBA

© Digital Equipment Corporation. Digital, the Digital logo, VAX, MicroVAX I, VMS, VAXcluster, ALL-IN-1, DATATRIEVE, DECnet, UNIBUS and MASSBUS are trademarks of Digital Equipment Corporation.
SNA is a trademark of International Business Machines Corporation.

VAXCLUSTERS LET YOU SHARE THE WEALTH OF VAX RESOURCES.

The large-scale storage and multi-user support you get with Digital's VAX 8600 system can be increased many times over with VAXcluster™ systems. This multiprocessing capability, which is unique in the industry, lets you combine the resources of several VAX processors and manage them as a single system. VAXcluster systems enhance data integrity and increase system availability, with complete user transparency.

VAXcluster systems can be configured with up to 16 processors and storage servers in a variety of combinations. You can boost computing power in an existing VAXcluster configuration by adding a VAX 8600 system. Or you can build a new VAXcluster using a VAX 8600 system as a compute server.

The wealth of resources available to all VAX systems includes VAX Information Architecture, which offers a CODASYL-compliant database – VAX DBMS; and a relational database – Rdb/VMS. This software, together with the RMS hierarchical file manager which is part of the VMS operating system, can all use the DATATRIEVE™ user-friendly query language. And they all benefit from a Common Data Dictionary that eliminates data redundancy and permits record-, field- and user-specific security controls. What's more, you can automate your office with Digital's ALL-IN-1™ software.

All VAX systems give you a complete set of program debuggers, editors, and screen management utilities to work with. You have a choice of 15 programming languages. And you can combine different languages in a single application through the common calling standard.

The expanding VAX family.

ENGINEERED FOR COMPATIBILITY AND RELIABILITY.

Digital's VAX 8600 system is compatible with every other VAX processor. It can also work with many other systems you may already own. Digital's DECnet™ networking software links Digital systems, users, files and applications over a variety of communication devices, such as Ethernet, leased lines, standard telephone lines, and public wide area networks. We offer protocols for communication with non-Digital environments, such as the SNA™ gateway.

The VAX 8600 system is engineered for the reliability your large-scale applications require. Self-diagnostic intelligence simplifies maintenance.

BEST ENGINEERED MEANS ENGINEERED TO A PLAN.

The VAX 8600 system, like all Digital hardware and software products, is engineered to conform to an overall computing strategy. This means our systems are engineered to work together easily and expand economically. Only Digital provides you with a single, integrated computing strategy direct from desktop to data center.

For a brochure on the VAX 8600 system, contact your local Digital sales office. Or call 1-800-DIGITAL, ext. 280.

THE BEST ENGINEERED COMPUTERS IN THE WORLD.

digital™

Rolm acquisition girds IBM for telecom, PBX mart push

CW AT ENTERPRISE INFO SYSTEMS

By Kathleen Burton
CW West Coast Bureau

SAN DIEGO — IBM's acquisition of Rolm Corp. will yield several new private branch exchange (PBX) voice and data products and represents the importance the company places on providing telecommunications products and services, an IBM marketing executive said recently.

At the Enterprise Information Systems Forum here, Kenneth B. Simon, IBM manager of product marketing, stressed the importance of IBM's recent acquisition of Rolm — the Santa Clara, Calif.-based telecommunications firm — and its 60% ownership of Satellite Business Systems, a satellite communications firm.

IBM plans to emphasize its thrust into the telecommunications arena in several ways, said Simon, by sponsoring business shows to announce and display new telecommunications products (IBM sponsored six such shows in 1984), by emphasizing issues and product-oriented advertising and by developing specialized telecommunications product marketing groups.

Expand telecom experts

IBM will also expand its cadre of telecommunications specialists from current bases in nine U.S. cities, and they will work closely with IBM account teams, he said. To support its customers directly, IBM also will develop executive briefings, hold seminars and offer network modeling to measure and predict a customer's future networking needs with a 99% accuracy rate, Simon said.

IBM's Fortune 1,000 accounts, according to Simon, are now demanding telecommunications products in several areas where IBM is not yet strong. Customer requests include voice terminals, digital workstations, remote high-speed digital links, digital multiplexers and networking capability to non-IBM hosts, he said.

Future products will focus on extending network connectivity, providing network management capability, expanding services and optimizing existing network configurations with enhancements to IBM's 3710 network controller and 7426 terminal interface, both introduced last year.

"Within the next year and a half, IBM will develop products that will connect a customer's manufacturing plant directly to his office," Simon said. The products will be extensions of IBM's token-bus protocols and broadband local-area network products, Simon said.

Customers will be able to customize the design by specifying whether they want independent local-area nets, networked IBM Personal Computers or structured intraoffice wiring. "IBM will also make an increasing thrust into the message marketplace," Simon said. IBM recently introduced its first messaging products: an audio distribution system, a telephone message management system and a voice/text messaging system, Simon said.

IPCP opens and closes CICS files using batch JCL.
✓many other CEMT/CEMT functions
✓eliminate PAUSE statements
✓free 30-day trial period
✓$1250 one-time or $63 month

sdx
A Division of J.[illegible] Lange, Inc.
5401 University Avenue N.E., Suite 300
Minneapolis, MN 55432
(612) 571-6600

Paladin out to restore credibility to Visicorp name

By Kathleen Sullivan
CW West Coast Bureau

LAS VEGAS — Paladin Software Corp. was a fledgling start-up in search of a second round of venture capital financing when it decided to merge with troubled, but cash rich, Visicorp.

The proposed merger of the two firms will solve Paladin's need for funds to continue working on its own product line, said Roy Folk, founder and president of Santa Clara, Calif.- based Paladin.

On the other hand, he acknowledged, the firm now shoulders a formidable task: restoring credibility to the Visicorp name and reclaiming confidence in its product line.

In an interview at the recent Comdex/Fall '84 held here, Folk, who worked at Visicorp for 2½ years before starting at Paladin, said he was confident the new firm "will be able to resurrect the good memories" that Visicorp was once able to evoke.

The new company, which will be known as Paladin Software Corp., will be headquartered in San Jose, Calif.

Visicorp, which gained early prominence in the personal computer industry as the distributor of Visicalc, has been beset with problems during the past year and a half.

When it was unable to provide enhancements to Visicalc, the firm lost market share and revenues to new competitors such as Lotus Development Corp. After an extended legal battle with Visicalc's creators, Software Arts, Inc., Visicorp lost the right to market its flagship product.

Problems with Visi On

In addition, Visicorp faced product delays and technical problems when it tried to design its next generation of software, an operating environment known as Visi On, Folk said.

But Folk said Paladin is prepared to restore the health and viability of Visicorp's product line, which includes Visi Series programs such as Visi Word and Visi Schedule, Flash Calc, PC Paint and Visi On.

As evidence of Paladin's commitment, Folk pointed to several product introductions made recently at Comdex. Included among them was a new version of Visi On, designed for the IBM Personal Computer AT. The new version, which takes advantage of the AT's 286 microprocessor, runs 3½ times faster than the original Visi On, Folk said.

More applications

When the original Visi On was unveiled, only one applications program was available, Folk noted. But now, all the applications programs for Visi On are ready, including spreadsheet, word processing, business graphics and presentation graphics programs, Folk said.

Paladin has also answered critics that said Visi On was overpriced. At $495, Visi On is aggressively priced to go up against industry leaders such as Lotus' 1-2-3 and Symphony and Ashton-Tate's Framework, Folk claimed.

"If we have the quality product that I believe we have, we now face the grueling task of turning dealers around," he said.

Folk declined to describe the products that Paladin has been working on. "We want to maintain a low profile until we are prepared to announce and ship the product," he said.

He said the products, which are being developed for the business market, will be introduced next year.

Long talks led to Visual Technology buy-out

By Kathleen Sullivan
CW West Coast Bureau

LAS VEGAS — The proposed acquisition by Lee Data Corp., the Flying Cloud, Minn.-based vendor of IBM-compatible terminals and workstations, of Visual Technology, Inc., a Tewksbury, Mass., firm [CW, Nov. 19], had been under discussion for about two years, according to the presidents of both companies.

In a deal worth about $17 million, Visual Technology would become a wholly owned subsidiary of Lee Data, according to a preliminary merger agreement. Visual Technology would retain its current management, and its president, Tom Foley, would join Lee Data's board of directors.

Visual Technology, which sells Digital Equipment Corp.-compatible terminals, a Televideo Systems, Inc. emulator terminal and a 16-lb IBM-compatible portable, last week introduced the Visual 2000, a Microsoft Corp. Xenix-based multiuser system.

In an interview at the recent Comdex/Fall '84 here, John M. Lee, president of Lee Data, and Visual Technology's Foley said the proposed merger would serve to round out each other's product lines and strengthen each company's competitive position.

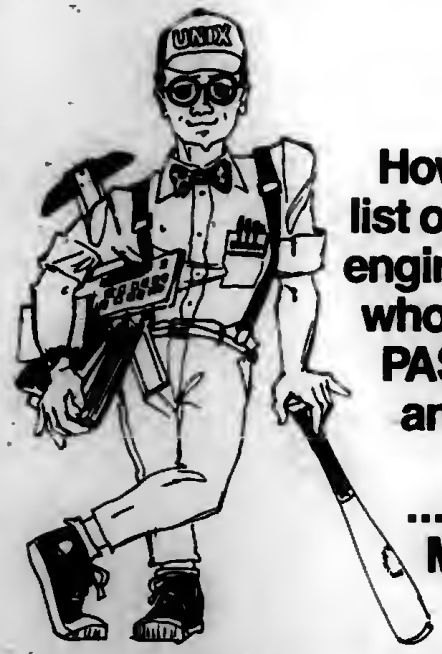
"Every one of our customers has IBM and non-IBM systems," Lee said. "With the merger, we will be able to sell IBM as well as non-IBM systems."

Foley said he expected "substantial incremental sales" when Lee Data's national sales force begins selling his firm's products. He said the two firms are currently discussing the sale of Lee Data's products through Visual Technology's third-party distribution network.

Foley said the proposed merger will fortify Visual Technology's financial base. The planned merger will also serve to strengthen each firm's market position, he said.

Lee said Visual Technology's portable, known as the Commuter, would serve as a "nice entry-level product," in the Lee Data product line. He added that the company planned to integrate Visual's new 2000 system into Lee Data's next generation of 3270 products.

The planned merger calls for the exchange of a half share of Lee Data stock for each share of Visual Technology's 4.9 million shares of outstanding common stock. At Lee Data's closing price on Nov. 9 of $6.85 a share, the transaction is reportedly valued at approximately $16.8 million. The merger is subject to the approval of each company's board of directors as well as each firm's shareholders.



How would you like a list of all the left-handed engineers in the country who play baseball, talk PASCAL, know UNIX* and like Magritte...

...on your desk by Monday morning?

You know going to search can often be going nowhere fast. It's usually months before you get any action. Seasons come and go, leaves fall, flowers bloom and you're still sitting in front of the same stack of requisitions.

CORS offers you a different and more effective approach and, as if that doesn't enough, we'd like to add that we do it for much less than standard search fees.

Isn't it about time you had a new method, a better system, a more effective way to go about your business? The recruiting office seems to have been left behind as changes swept into every other area of Human Resource Management. New theories, practices and techniques abound in compensation, benefits and employee relations—yet recruiting has been left to sing another chorus of Yesterday.

And isn't it about time that someone looked at how search firms determine fees. Think about it. The left-handed, art-loving engineer mentioned above is about as hard to find as a new Chairman of the Board. But headhunters play the percentages. The higher the salary of the incumbent the higher the fee you and up paying. Isn't it a basic law of economics that what you pay should in some way be related to what it costs to deliver the product or service? Of course, the result of this imbalance is that all the search energy goes into the top paying jobs and you can get left with a lot of holes in your middle management.

CORS does it differently. We charge $65 an hour.

And for that you get the kind of research it takes months for a search firm to deliver bound and on your desk in 1 week.

How does it work? You talk to our Industry Analyst, a qualified executive who knows your industry cold. From this discussion, a detailed brief of your position is developed. This information is passed on to our researchers who compile candidates who meet your specifications. The latest in state of the art systems and database technologies is running full time in our backrooms. The focus of our service is a research capability that no search firm could afford to deliver.

We screen candidates on the phone and proceed to identify candidates we think you should talk to. Additional data results from these in-depth interviews and we pass that along with our candidate recommendations. You'll get information on your company's image in the marketplace, evaluations of your competitors and some reaction to the job, salary, etc. that you're looking to fill. We can even handle reference checks and psychological testing if you wish.

CORS figures the above service usually takes 40 hours. However, we offer a package—The CORS Report—which includes your screened candidate list and all the above additional information for a set fee of $2290 (phone and travel expenses are additional). It's easier for both of us than counting the hours.

So if you're looking for a right-handed marketing director who reads Fitzgerald and knows semiconductors—and you, as usual, needed he/her yesterday—think of CORS.

We know the best solutions are usually the last ones.

If you'd like to receive more information, or would just like to talk about how CORS may be able to help meet your current needs, please call Tom DeBourcy, Director of Marketing, 1-800-323-1352. (Within Illinois, (312) 773-6555.)

CORS

Not just state-of-the-art in Human Resource Services

Suite 100 Hamilton Lakes, 500 Park Boulevard, Itasca, IL 60143 • 2040 Avenue of the Stars, Suite 400, Los Angeles, CA 90067
Stratford Building Number Four, 175 Strafford Avenue, Wayne, PA 19087
* UNIX is a registered trademark of AT&T.

Profits up at Cullinet

WESTWOOD, Mass. — Cullinet Software, Inc. last week reported second-quarter profits of $5.9 million, or 39 cents per share, up 57% from year-earlier profits of $3.8 million, or 25 cents per share.

For the quarter ended Oct. 31, the company reported revenues of $43.6 million, a 58% increase over the second quarter a year ago when revenues were $27.7 million.

Robert N. Goldman, president and chief operating officer of the company, noted the report represented the 27th consecutive period of increases in both revenues and profits.

Cullinet continues to experience rapid growth in sales of mainframe data base management and applications products and also began shipping its Goldengate microcomputer integrated software package during the quarter, Goldman said.

MAI set to sell Basic Four unit

NEW YORK — Management Assistance, Inc. (MAI) said recently that it has signed an agreement for the sale of its Basic Four Information Systems unit to a company formed by Bennett S. LeBow, a private investor.

The company said the final sale is still contingent upon approval of the purchaser's financing arrangements. "The financing arrangements have progressed sufficiently for us to sign the definitive agreement," the company said in a statement.

LeBow reportedly will pay $30 million in cash and $75 million of debt and preferred stock for the Basic Four unit.

MAI is also in the process of selling its other major segment, the Sorbus Service division, to Bell Atlantic Corp. for $175 million. That sale must be approved by a federal court.

MAI said it has filed a preliminary proxy statement with the Securities and Exchange Commission for the complete liquidation of assets and dissolution of the company following the sale of its two divisions.

HP reports $665 million tax-benefited profit

PALO ALTO, Calif. — Aided by a $118 million tax-change windfall, Hewlett-Packard Co. last week reported fiscal year 1984 profits of $665 million or $2.59 per share, compared with year-earlier profits of $432 million or $1.69 per share.

HP reported an extraordinary tax benefit of $118 million resulting from federal tax law changes earlier this year, which forgave accrued tax liabilities owed by domestic international sales corporations. Discounting the tax benefit, HP said its profits for the year would have increased by 27% to about $654 million or $2.65 per share.

Revenues for the year were $6 billion, a 28% increase over year-earlier revenues of $4.7 billion. For the fourth quarter, the company reported profits of $167 million, or 65 cents per share, up 14% compared with year-earlier profits of $147 million, or 57 cents per share. Revenues for the quarter were $1.6 billion, up 27% from the fourth quarter of 1983 when revenues were $1.3 billion.

The fourth-quarter profits were not particularly strong and HP President and Chief Executive Officer John A. Young said that reflected a competitive environment and discounts and aggressive foreign pricing to help offset the effects of the strong U.S. dollar overseas.

Young also said that while orders in the quarter remained strong, there was a softening of orders in the U.S., which climbed only 13% over year-earlier figures, while international orders rose 39% in the same period.

Datapoint profits plunge

SAN ANTONIO — Datapoint Corp. reported a more than threefold decline in profits for the first quarter, with revenues just barely ahead of year-earlier results.

Profits for the period ended Oct. 27 were $1.5 million, or 7 cents a share, compared with $5.4 million, or 27 cents a share, in the same period a year earlier.

First-quarter revenues were $140.1 million, compared with $139.7 million a year ago.

"Although revenue in the quarter was virtually the same as a year ago, sales revenue in our domestic markets was down substantially, from the first quarter last year, reflecting the depressed order rate and lower backlog experienced in the fourth quarter," said Harold E. O'Kelley, board chairman and chief executive officer, in remarks at the company's Nov. 15 annual meeting here.

O'Kelley attributed the lower profits to "slightly lower" gross profit margins, increased engineering and product development costs related to new product introductions and increased marketing costs for international subsidiaries.

O'Kelley said that the continued strengthening of the U.S. dollar overseas had an adverse effect on the company's international business. He said the company plans to expand its product line and to extend its position in local-area network products.

ACRS from page 97

try, which has honed the entrepreneurial spirit to a fine edge by using ACRS and other tax loopholes to finance leases through outside investors who reap the benefits of ACRS and investment tax credits.

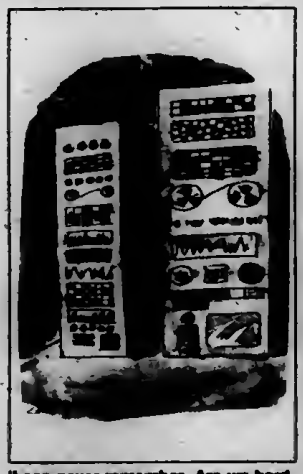
While ACRS is sometimes criticized for favoring older, smokestack industries over high-tech industries, various elements in the computer industry have been arguing that depreciation should be accelerated for computer equipment.

R&D tax credits unlikely

In the current climate, that seems unlikely; what seems even more unlikely is expansion of R&D tax credits.

When the Reagan administration came to Washington, D.C. in early 1981, it was the fragmented coalition of liberals and social groups that howled with fright.

If current signals are correct, businessmen and supply-side conservatives will howl the loudest in early 1985.



'I can never remember. Are we hardware or software?'

Microcomputer
Software
in Print
'85

• ADVERTISEMENT • ADVERTISEMENT •

Directory Lists 16,000 D P Users

NEW YORK - The 4th edition of the 1984 Directory of Computer Installations, lists 16,000 computer users in NY, NJ & CT.
Each site includes a profile of the hardware installed, software installed, (languages, databases, etc.), consultants used, future plans, applications and DP executives' names, titles, and phone numbers. An Index provides quick access to 133 cross references by hardware, software and industry. Price-$370. Call (212) 683-0606. Computer Management Research, Inc. 20 Waterside Plaza, NY, NY 10010. Act now and receive free vendors' directory.

• ADVERTISEMENT • ADVERTISEMENT •

COMPUTER INDUSTRY

Eagle revenues fall sharply

GARDEN GROVE, Calif. — Eagle Computer, Inc. reported a $2.3 million loss, or 16 cents per share, on sharply lower revenues for the first quarter ended Sept. 29.

In the year-earlier period, Eagle, a maker of IBM-compatible microcomputers, had a profit of $81,000, or one cent per share. Revenues for the latest quarter were $4 million, compared with revenues of $14.2 million a year ago.

Ronald N. Mickwee, Eagle chairman, said the first-quarter results were "as we predicted." He noted that the results showed improvement over the prior two dismal quarters, attributing that to cost-cutting measures taken during the past several months.

The company recently laid off 55 employees, closed its headquarters in Los Gatos, Calif., and moved its operations to its manufacturing plant here.

In the fourth quarter ended June 30, the company reported a staggering loss of $17 million, nearly four times the $4.9 million in revenues it took in during that period.

Although the company's latest revenue figures were still lower than the earlier quarter, Mickwee, referring to the reduction in losses, said, "Our plan continues to work; we've apparently turned the corner."

On a brighter note, the company announced it had received government approval for more than $4 million in desktop microcomputer orders from China.

Eagle said it anticipates approval of additional orders in the near future.

IBM from page 97

cations backlogs of two years in DP departments were slowing growth. Another survey of Fortune 500 companies in 1978 showed the backlog to be four years. IBM was losing revenue because of the bottlenecks, and minicomputer vendors were providing frustrated users with solutions.

The bottlenecks were partly IBM's fault, he added, because the 1978 survey showed that programmers were spending 80% of their time maintaining applications and only 20% of their time developing new applications. "By too frequent operating system releases, IBM was shooting itself in the foot and creating a maintenance problem on its user sites," Lamond said. With on-line programming replacing off-line batch programming and users having access to a data base to run their own applications, the productivity figures have been reversed, Lamond said.

Minicomputer vendors

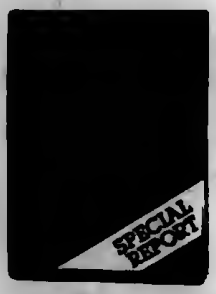
While DP departments were struggling with two- to four-year bottlenecks, the minicomputer vendors were able to deliver dedicated minicomputers to end users within six months.

This was due in part to DP departments programming on mainframes in Cobol while minicomputer vendors provided customized standard application packages. To help meet the competition, IBM announced programmable small-business minicomputers such as System/36, in addition to the productivity aids, according to Lamond.

"That is the IBM strategy to help you all be more productive, so that you more quickly need more IBM processing power," Lamond said. The productivity aids are in the best interest of users "if your DP programmers cannot keep up with end-user requests for new applications" and if the application backlog is growing, he said.

Alternatives do exist to implementing the productivity aids on a central mainframe, including desktop personal computers or time-sharing with the mainframe, and to implementing on-line, real-time transaction processing, Lamond advised.

If you're not in *Computerworld's* next special report, look at the issue you'll miss



December 31 & January 7

'85 Forecast

Our annual review and forecast issue. We'll examine some of the major events of 1984, and explore what lies ahead in 1985.

Color close: December 14
Black & White close: December 20

☐ Please send me advertising information on the '85 Forecast issue.
☐ Please have a sales representative call me.

Name _____
Title _____
Company _____
Address _____
City _____ State _____ Zip _____
Telephone _____

Return to:
Ed Marecki, National Sales Director
Computerworld
375 Cochituate Road
Box 880, Framingham MA 01701

Call the Sales Office nearest you to reserve space in any of our upcoming issues. You'll find the numbers listed below. Or, if you prefer, fill out the coupon and return it today. Do it now. The sooner we hear from you, the sooner you'll hear from our readers.

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
BOSTON: (617) 879-0700/*CHICAGO:* (312) 887-4402/*NEW YORK:* (201) 967-1350
ATLANTA: (404) 394-0754/*HOUSTON:* (713) 952-1230
LOS ANGELES: (714) 261-1220/*SAN FRANCISCO:* (415) 421-7230

A PUBLICATION OF CW COMMUNICATIONS

U.S. chip billings declining

SAN JOSE, Calif. — Semiconductor bookings and billings in the U.S. continued their downward trend in October, according to Semiconductor Industry Association statistics.

The association's yardstick of its member companies' health, the book-to-bill ratio, measuring new orders against completed orders, fell to 0.67:1 in October.

A figure of 1.1:1 or 1.2:1 is generally considered good.

The figure includes bookings and billings for semiconductor manufacturers based in the U.S., Europe and Japan.

In October, the association said, semiconductor users continued to reduce inventories accumulated during late 1983 and early 1984, a period of exceptionally high orders.

"While the short-term situation is of great concern to the industry, we believe that the underlying fundamentals of the economy will support continued long-term growth," said association President Thomas D. Hinkelman.

Hinkelman said that the U.S. Department of Commerce has estimated that the electronics industry — the largest consumer of semiconductors — will experience an 18% growth this year and 15% growth in 1985. He said the association believes that purchasing agents for those manufacturers overbought during the first nine months of 1984.

STC from page 97

Ross & Co. in New York, the accounting firm that reportedly helped put the agreement together, said the firm had no comment.

Richard Hastings, an analyst with Merrill Lynch & Co. in New York, said he was not surprised that the loan fell through. "When they first announced [the loan], I thought it definitely wasn't a done deal," he said, adding, "The company is operating under Chapter 11, with numerous creditors having a stake in what's going on. It was a tentative thing from the start."

Even if the $150 million loan had gone through, Hastings said, it would only have bought some time for STC. "I think the problems there are very deep," he added. "I don't expect the company to come out [of Chapter 11] as an independent entity in any shape or form."

Under the agreement with Chemical Bank, the bank would have been given "superpriority" over the company's other unsecured creditors, the largest of which is New York-based Citibank, which is owed $38 million. STC would have paid interest on the funds at 1.5% above the prime interest rate.

Analysts have said STC is likely to be liquidated or acquired if it does not receive significant funds to operate soon.

Pressured by its creditors and in default on most of its bank loans, STC filed for Chapter 11 on Oct. 31. As of Sept. 28, the company owed about $450 million in long- and short-term debt, about $15.7 million of which was secured, according to company financial data.

MSA from page 97

dum," which was sent to 50 interested individuals, Smart said. The memorandum broke the firm down into four separate groups — business software, international sales, educational software and microcomputer distribution — that could be bought separately.

Why did MSA decide to sell Peachtree, which is known for its accounting software designed for the IBM Personal Computer? When MSA purchased Peachtree 3½ years ago, the mainframe software firm hoped to find some "synergism or economies of scale" through the acquisition, Smart said.

But instead, MSA and Peachtree discovered very little overlap between selling mainframe software to executives and selling microcomputer software through retail channels, Smart said.

And Peachtree stopped "acting like a microcomputer software company." The operations of the subsidiary moved into MSA's building in Atlanta and, in the process, were transformed from a low- to a high-overhead firm, Smart said. "Our overhead must have quadrupled since we became an MSA company," he said.

The metamorphosis of Peachtree will include a new emphasis on retail sales. In the past, Smart said, more than 50% of Peachtree's revenues came from sales to hardware companies. While selling software to manufacturers maximized revenues in the short term, it proved to be a poor strategy in the long term. When the personal computer industry stumbled, Peachtree suffered.

But Smart was optimistic about the firm's future. Peachtree has already started to act on plans to revamp the company's strategies, he said. He predicted the company's revenues would reach between $15 and $20 million in 1985 and said the firm, which was not profitable this year, will be profitable next year.

It will not be an easy task though, because in addition to its traditional competitors, Peachtree has a new foe. In September IBM joined the field, announcing its Business Management series of accounting software.

Once a buyer is found, the actual sale could take up to nine months to finalize, Smart said. In the meantime, MSA has not curbed Peachtree's spending or development work, he said.

How to advertise in every major computer market in the world as easily as you advertise in the U.S.

CW INTERNATIONAL Marketing Services will help you penetrate the most profitable computer markets worldwide — easily, effectively, and economically.

Your ads will receive the attention they deserve. Our network of more than 55 computer publications in 25 countries is the largest in existence. Over 9,000,000 computer-involved people read our publications every month.

With more than 10 years experience in international marketing, we're the only service of our kind. We can help you make your ads more effective. Our local offices can translate your ads for a 15% surcharge on the space you purchase.

We'll help you increase your market penetration. Because we place your advertising through our U.S. office, you won't have to pay the VAT (value added tax, ranging from 8-20% of your ad-space purchases) which is regularly charged on all advertising placed abroad. And you'll be able to advertise in even more markets when you take advantage of our corporate discounts.

We're also available to advise you on your campaign strategy — such as when to advertise in order to coincide with special-focus issues and trade shows.

All you need to do is send us your advertising materials. We'll handle all the transactions. And we'll bill you in U.S. dollars so you won't have to worry about exchange rates.

Call Diana La Muraglia today if you want to reach the computer buyers in any of the following countries: Argentina, Australia, Brazil, Canada, Chile, Denmark, Finland, France, Greece, India, Italy, Japan, Korea, Mexico, Norway, People's Republic of China, Saudi Arabia, South Africa, Southeast Asia, Spain, Sweden, The Netherlands, United Kingdom and West Germany.

You can reach her toll-free at (800) 343-6474. In Massachusetts call (617) 879-0700. Or you can reach her through Telex, at number 95-1153. Or, if you prefer, fill out the coupon below and return it today. Do it now. The sooner we hear from you, the sooner you'll hear from our readers.

CW COMMUNICATIONS/INC.

Diana La Muraglia
General Manager
CW International Marketing Services
375 Cochituate Road, Box 880
Framingham, MA 01701

☐ Please send me more information about your International Marketing Services.
☐ Please have a sales representative call me.

Name _____
Title _____
Company _____
Address _____
City _____ State _____ Zip _____
Telephone _____

POSITION ANNOUNCEMENTS

For data processing brain-power think of EDPeople, a service of Robert Half.

Intelligent machines need intelligent people. And Robert Half has been finding these people since the computer revolution began.

We know the job market, and we know the right people to meet your EDP requirements.

Call any of Robert Half's 80 offices in the United States, Canada and Great Britain. We'd like to help you hire smart.

© 1984 Robert Half International Inc. All offices independently owned and operated

FLORIDA

We are a multi-office organization with 10 years experience in Data Processing placement. We have the following immediate opportunities available in Florida:

- SYSTEMS PROGRAMMERS (IBM)
- COMMUNICATIONS/NETWORKING
- BANKING APPLICATIONS (any hardware)
- PA's with CICS
- RETAIL APPLICATIONS (IBM)
- SOFTWARE ENGINEERS (ASK, "C", 370/assembler)
- RPG II PROGRAMMERS

Salaries $30K-$40K. All fees, interview and relocation expenses are paid for by client companies. Contact:

Tony Weiss
SCHOLARD R RITA
(813) 877-0765
4802 Bay Shore Blvd., Suite 100
Tampa, FL 33607

Bryant Bureau

HAS THE COMPUTER PROGRAM FOR YOU

If you're not accomplishing your career goals, let us put you in the right environment. Our national database of client companies are constantly looking for progressive DP professionals who want to remain state of the art.

NATIONWIDE OPPORTUNITIES

IBM/AMDAHL In-house Operat EDP	to $40K
IBM 4341 CICS PA COBOL	to $30K
SPERRY 1100 Data Comm Specialist	to $40K
SPERRY 1100 Exec Internals Spec	to $40K
HON Data Comm/DCDS 3 Support	to $41K
BUR DMS Support	to $40K
TANDEM PA plus evaluating appl	to $40K
TANDEM PA on-line ALGOL TAL	to $37K
DEC VAX Comm Programmer	to $30K
BUR PA (IMS)	to $30K

To become part of the growth in the 80's, call toll free or send your resume with salary history and any relocation restrictions.

Bryant Bureau
DP Division
4000 S. Tamiami Trail, S-300
Sarasota, FL 33581

PROGRAMMERS AND ANALYSTS

One of So. California's fastest growing contract/consulting services is still experiencing rapid growth. We have many current openings for long term assignments, and are searching for candidates with 2 years or more in the following disciplines: COBOL, ASSEMBLER-Language, MS DOS/CC, ADABASE Applications, Design Analysis, TANDEM, CICS, and Systems/Programming. We need people with experience in financial, insurance and manufacturing distribution systems.

We offer top remuneration plans, excellent fringes, exciting assignments and lots of growth opportunity.

Call (213) 380-3881 OR SEND RESUME TO:

cpd Commercial Programming Systems Inc.
3450 West 6th Street, #300
Los Angeles, California 90020

Arizona/California/Texas/Colorado/Florida/Boston
SCIENTIFIC OR BUSINESS PROGRAMMERS
All fees and relocation paid. $25-45,000
If you have a BSEE, BSCS, BS in Mathematics or Physics or equivalent, we need you right now.
For Business: OS/DOS/IMS/CICS/MVS/JES Prog/Anal/Systems/Data Base. All large scale installations.
For Scientific: experience in the computer, communications, semiconductor, or aerospace/defense industries.
Your name, resume, and present employer will not be given out without your permission.
For sincere personal service, please send a confidential resume to:
Ben Pullman (602) 274-5000
PULLMAN PERSONNEL
3003 North Central Ave., Suite 500, Phoenix, Arizona 85012

M.I.S. PROFESSIONALS
HONEYWELL preferred
TECH SUPPORT
DATA BASE
ANALYSTS
& PROGRAMMERS
We are a $1.5 BILLION Southeast service related corporation. Reply in confidence with salary requirements. (EOE)
CW-B4696
COMPUTERWORLD
Box 880
Framingham, MA 01701

DATA LINK

COME TO NEW ENGLAND
and see what we have to offer!

New England has skiing, sailing, mountains, beaches, a Courier and has atmosphere, and a professional climate that is very exciting; i.e., PA's, S/P's, SW Eng's with experience in PDP, INTEL, HONEYWELL, IBM, WANG, A UNIX, C and graphics background is also desirable.

Send us your resume or call, and let DATA LINK introduce you to New England.

Our list of client companies is endless, and all fees, interviews and relocation expenses are paid by our clients.

DATA LINK
National Recruiting Consultants
Exeter Professional Building
Hampton Road, Exeter, NH 03833
(603) 772-5400

POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS

SYSTEMS ANALYSTS

PROGRAMMER/ANALYSTS

NCR, a leader in hospital information systems since the early '70s, is now embarking on the most comprehensive and cost effective Hospital Information System ever designed. This effort offers exciting career prospects to professionals with or without a hospital background.

Hospital Industry Analysts—Will define current and future hospital industry information processing requirements, including hardware and software functionality, data relationships, and design standards. Requirements include industry expertise in the areas of Pharmacy, Clinical Laboratory, Radiology, and Nursing Administration. Must be capable of working both independently and in a team and will present design concepts to a diverse group of users and developers.

Lead Analysts—Will create Functional-SPECS and Implementation-SPECS from requirements documents. Ideally all applicants must be innovative professionals with strong working knowledge of COBOL, Transaction Processing and Data Base essential. Knowledge of TOTAL and DMS useful.

Microcomputer Specialist—Will design, program and implement applications of the new interactive intelligent work stations using BASIC, PASCAL and C in a UNIX* environment. Micro to mainframe expertise is a plus.

All positions require a BS degree in Computer Science or related area. Appropriate experience may be considered in lieu of degree. These openings are based at NCR's headquarters in Dayton, Ohio—one of the Midwest's most attractive and affordable areas.

Salary commensurate to qualifications. Excellent benefits and outstanding career prospects are offered. For prompt, confidential consideration send resume and salary history to: Mr. Robert Brown, NCR Corporation, Dept. KB8, U8Q-1, Dayton, Ohio 45479.

NCR

1884-1984
Celebrating the future

An equal opportunity employer
*Trademark of AT&T Bell Laboratories

Management Information Systems

Badische Corporation, located in Anderson, South Carolina, has immediate openings due to expansion and growth opportunities in its Corporate M.I.S. Group.

SYSTEMS ANALYSTS

Positions require a degree and at least 7 years total experience, with at least 2 years in systems analysis. Experience in design of on-line/real time COBOL applications, order processing, inventory or financial systems applications preferred.

PROGRAMMER ANALYSTS

Requires a degree and a minimum of 3 years experience. MUST HAVE COBOL. Applications experience preferred in order processing, inventory or financial systems applications.

Competitive Salaries, Excellent Fringes, Top Relocation Assistance

If interested, send resume to: Personnel Supervisor, Badische Corporation, P.O. Drawer 3025, Anderson, South Carolina 29621-0025

Badische Corporation
Anderson, S.C. 29621-0025
Member of the BASF Group

an equal opportunity employer m/f/h

By looking toward the future, one of the greatest scientists of our time, Albert Einstein, challenged the thinking of his day with his theories of relativity which re-defined the concepts of space and time.

You can take part in a successful tradition of creating the future. With Compugraphic.

"Imagination is more important than knowledge"
Albert Einstein

We've got the Systems for Success

Yours and ours.

Systems that are changing the way the world looks at graphic communications. Systems as flexible as your needs . . . and needs of our customers.

At Compugraphic, we've worked hard to redefine technology, from the ground up. To change the course of graphic communications in new and exciting directions and applications. And we did it with the help of talented and creative Software Engineering professionals like you, who have an eye on the future.

The results of this forward thinking are reflected in record sales of $350 million in the past 12 months (with a record $100 million in the third quarter alone), and in graphic systems as diverse as the requirements and needs of an industry itself. Systems that are bringing success not only to our customers, but to us and the talented professionals who helped us create them.

If you're creative, experienced and ready to explore, innovate and take chances . . . we've got the system for your success. And it's waiting for you, now, at Compugraphic.

MODULAR COMPOSITION SYSTEMS

A product development group dedicated to developing the next generation of graphics interactive text processing products.

Software Section Manager

Excellent opportunity to lead a team of up to 16 software professionals in the design and development of a highly interactive "what you see is what you get" bit-map graphics workstation.

- Intel 80186 microprocessor
- 1+ mb memory
- "C", UNIX™

Sr. Software Engineers

Exceptional opportunity to be senior contributor in new group responsible for:

- Operating systems and software security
- Memory management
- Intelligent peripherals and co-processor interfaces
- Development environment for 286/486 Intel microprocessors

GRAPHIC ARTS

Sr. Software Engineers

Several positions available at all but entry level. You should possess the following skills and capabilities.

- Micro-base software development
- Graphics/text software background
- Familiarity with Assembly, "C" or Pascal
- Real-time systems
- Device drivers, systems supervisors and file systems

ENGINEERING TECHNOLOGY

In-house design teams responsible for targetting and developing new technologies for product design groups.

Sr. Diagnostic Engineers

Utilize your problem solving skills by developing software to find hardware faults in microprocessor based systems.

- Experience in assembly or firmware
- An understanding of hardware. You must be able to influence design for testability
- BSEE or BSCS and at least 5 years' experience

NEW PRODUCT DEVELOPMENT

Senior/Principal Software Engineers

There are several lead technical positions in new product areas which are just beginning and which represent outstanding challenges and growth opportunities.

- Composition and pagination
- Display ad and terminal applications
- Software Q.A.
- UNIX™ internals
- Raster graphics
- Hierarchical database
- System/file servers

We employ 4000 people and offer excellent salaries, benefits and a relocation package. Compugraphic is located off Route 128—America's High Technology Highway. We're just 20 minutes from all the educational and cultural resources of Boston and close enough to enjoy the many recreational opportunities of New England's beautiful mountains and beaches.

Please Send Resumes to Rose C. Wilson.

compugraphic
200 Ballardvale St., Wilmington, MA 01887
Creating the Future of Graphic Communication
An Equal Opportunity Employer

CONSULTANT PROGRAMMER/ANALYST - to write new financial system including coding, testing and debugging of programs, utilizing System 2000 Data Base, OS/JCL, and working on medium system IBM mainframe. Salary $12.00 per hr., basic 40 hour week. Requirements 6 years college, Master's Degree in Computer Science. Send resume to MESC, 7310 Woodward Ave., Room 415, Detroit, MI 48202, reference No. 44584. Employer paid ad.

Data Processing Manager

We are an International CPA firm. Our client, a successful wholesaler and reseller located in Southern California is seeking a Manager of Information Systems.

The successful candidate will have a B.S. or B.A. Degree, RICK operating system experience and six to eight years D.P. experience including two years in management. The candidate must have good project management, administrative, communication and personnel skills and be capable of working with creative rather than pre-programmed approaches. The candidate will also have a business orientation as well as strong technical skills.

The organization offers excellent benefits and the salary ranges from $35,000 to $40,000 per year commensurate with experience.

If you are interested in growing both technically and professionally with our client, please send your resume with salary history in strictest confidence to:

Box CW-84099, Computerworld, Box 880, Framingham, MA 01701

DATA PROCESSING PROFESSIONALS

When Aramco Services Company hires you for work in Houston, you'll earn a fine competitive salary and participate in a very attractive benefits program.

You'll also gain professional experience that you probably could not duplicate anywhere. Your work will be in support of Aramco, the largest oil-producing company in the world.

Join us in one of the following high visibility roles:

DASD MANAGEMENT ANALYST

Requires a BS, preferably in Computer Science, and 7+ years in computer systems analysis, including DASD management/analysis, HSM and ASM2. Ability to analyze/evaluate 3350/3380 DASD utilization, and justify/present recommendations for standards, policies and procedures is essential.

OFFICE AUTOMATION ANALYST

Requires a BS in Computer Science or Engineering, and 6+ years systems analysis experience in the field of office automation, using minicomputers and microprocessors. Also required is the ability to perform system engineering, problem analysis, office automation evaluation, make recommendations, and handle project management. Wang and IBM OA experience preferred.

CAPACITY PLANNER

Requires Bachelor's degree, preferably in Computer Science or Math, a minimum of 7 years experience with IBM 3081, MVS/XA, and at least 1 year in capacity planning activities including workload forecasting, impact analysis, hardware planning/usage and service reporting. Experience with MICS, BEST 1, and SAS is desirable.

SYSTEMS PROGRAMMER

Requires a BS in Computer Science and 3-7 years in an IBM-MVS environment with knowledge of IBM 370 Assembler. Problem determination and resolution skills are required in any of the following areas: IMS DB/DC, CICS, IBM Program Products, TMS, SAS and PGF-CDDM. Past experience supporting MICS is a definite advantage for qualified candidates.

DATABASE ANALYST

Requires a BS in Computer Science and 5 or more years experience with physical and logical data base design, IMS/DB-DC, IMS utilities and performance monitoring and tuning in an IBM-MVS/XA, JES2 environment.

We offer fine competitive salaries and extensive benefits including medical/dental coverage, savings plan with company participation, continuing education programs, a company cafeteria, van pools, and paid parking.

Find out more by sending your resume to:
Chip Smith, Aramco Services Company
B-103-4, P.O. Box 4531, Houston, TX 77210.

ARAMCO
SERVICES COMPANY

MANAGERS IN HIGH-TECH EDUCATION

Applicon's Education Department is aggressively expanding its operation by adding staff and facility resources nationwide. During this exciting growth phase, we need capable, enthusiastic, and experienced individuals to fill our key openings. Besides the existing openings for CAD/CAM Instructors and Course Developers, the following challenging management positions are available:

Customer Applications Engineering Education Manager

In this position, you will manage other managers who are responsible for designing, developing, and implementing Customer and Application Engineer training programs/products nationwide. By leading and directing a group of highly motivated, capable professionals, you will refine and expand the existing curriculum.

To qualify, you should have at least three years of high-tech education management experience and over 5 years of experience in the high-tech industry. Experience in the CAD/CAM industry is a plus. A Bachelor's Degree or commensurate experience is required.

Sales Education Manager

As a key member of our Education Department and Sales Organization, you will design, develop, and deliver Sales Education programs, providing product and sales skills training to Applicon's worldwide sales organization.

You should have 2 years of high-tech sales training experience and/or 3 years of successful high-tech sales experience. Management experience a plus.

Send resumes to Deborah Rorke, Dept. CW1119, Applicon, A Schlumberger Company, 32 Second Avenue, Burlington, MA 01803. We are interested in your talent, not your age, sex or race.

Applicon
A SCHLUMBERGER COMPANY

CICS

$1,000. Sign On Bonus

An internationally recognized consulting firm providing input to the manufacturing, oil and gas industries, has retained J. Randall Associates to identify Programmers and Analysts for immediate assignments in

- Maryland
- Texas
- Florida
- North Carolina
- Virginia
- Massachusetts
- California
- Ohio

These positions require at least one year professional experience in CICS (Command or Macro). IMS, DB/DC, DL1, DMS, or IDMS experience considered a plus but not required.

Salaries open to $38K. For additional information please forward resume or call collect

Nick Nichols
J. Randall Associates
P. O. Box 1521
Rockville, Maryland 20850
(301) 840-0460

An Equal Opportunity Employer

Programmer Analysts

Martin Marietta Aerospace in New Orleans is searching for Programmer Analysts who are looking for temporary work, March 1985-March 1986.

The position will involve a 40-hour work week programming on-line applications using TIP or DPS-1100, UNIVAC, EXEL 8, ECL, CTS or Test Editor. Also requires the knowledge of DML-1100 Data Base programming, COBOL programming and extensive use of data processing concepts. A minimum of a high school education with 2 years college (Associate degree or equivalent in computer science, mathematics, or related field) and 4 years of related working experience using the above programming applications in an industry manufacturing large capital goods, with knowledge of inventory methods and cost accounting. Salary will range from $25,000 to $40,000 based on related work experience and related education.

Interested candidates should immediately direct their resumes to: **Larry M. Holbrook, Sr. Specialist, Martin Marietta Aerospace, P.O. Box 29304, New Orleans, Louisiana 70189.** We are an equal opportunity employer, m/f/h.

MARTIN MARIETTA

DP POSITIONS NEW ORLEANS

Project Leader - IBM 3084, OS, MVS, DS/MVS, IMS data base system ..... $42.6K+

DBA - Experience in data base design, IMS DB-DB/DC ..... $42.6K+

Systems Programmer - IBM 3084, OS, MVS, DS/MVS, MVS-XA, VM-CMS $37.7K

Systems Programmer - IBM 4341, OS, MVS, CICS $25K

DBA Online Network, Total Package $36K

Technical Manager - OS, MVS, CICS $28-32K

Please call or forward resume to:

HILDA MARCHAND
CREATIVE CAREERS
(504) 522-7166
300 Carondelet St.
Suite 1007
New Orleans, LA 70130

SYSTEMS TECHNICIAN

The Modesto Bee, a 70,000 circulation, central California newspaper is in need of an individual to begin in-house maintenance of new Tandem computers and peripherals.

This position requires 4+ years technical experience and the proven ability to independently diagnose and repair computers and all peripherals. The Modesto Bee offers competitive salary and benefits along with an excellent location for a variety of recreational activities.

Submit application no later than January 14, 1985

THE MODESTO BEE
Personnel Office
1325 H Street
P.O. Box 3828
Modesto, CA 95352

E.O.E.

Women and Minorities encouraged to apply

DIRECTOR, INFORMATION SYSTEMS AND ADMINISTRATIVE COMPUTING

The University of Maryland University College
European Division Heidelberg, F.R. Germany

University College, the worldwide continuing education campus of The University of Maryland, conducts undergraduate and graduate programs in Europe, Asia, and Maryland/Washington, DC. The European Division, established in 1949, serves approximately 40,000 students a year in U.S. military communities in thirteen countries. The administrative headquarters of the European Division are at Heidelberg, F.R. Germany with a staff of 135. Administrative computing of the Heidelberg office is provided by a HP 3000 series 68 mini and HP 150 micros.

Responsibilities: The Director oversees all administrative computing operations of the European Division and is responsible for strategic planning to ensure that the European Division continues to provide advanced, high quality administrative computing and office automation; leads the development and implementation of a data network including distributed computing, micro and minicomputer workstations; develops applications and coordinates with users of administrative applications including financial, payroll, student records, management information systems; coordinates the overall operation of the administrative computing services, and other duties as assigned by the Director, European Division. Supervises a staff of ten.

Qualifications: Master's degree; extensive background in computer operating systems and hardware including minicomputing; a Thorough understanding of data communications networking; excellent interpersonal communication skills; a record of managerial accomplishment in a MI-series computing environment; familiarity with HP hardware. Specific knowledge of 3000 series 68 mini and HP micros is preferred.

Salary: Commensurate with qualifications

Expected Starting Date: February 1, 1985

Application Deadline and Procedure: The deadline is December 17, 1984. Submit a letter of application, professional resume, and the names of three references. Applications received after the deadline will be considered at the discretion of the Search Committee.

Search Committee, DISAC, c/o Chancellor's Office, The University of Maryland University College, University Boulevard at Adelphi Road, College Park, MD 20742

The University of Maryland is an Equal Opportunity, Affirmative Action Employer

POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS

PROGRAMMER/ ANALYSTS

We have an immediate need for Programmers with experience on the following Systems:

DEC-PDP 11/44 FORTRAN, RSX 11M, DOE "Q" Clearance a plus.

UNIVAC 1100, COBOL

These positions are in the Southeast and require a minimum of 3 years programming experience. If qualified, please send resume to:

IDI CORPORATION
107 Music City Circle
Suite 111
Nashville, TN 37214
(615)889-2484

IMS & CICS

Fox Morris specializes in the placement of all programmers and systems analysts who have database or CICS experience. You will receive PROMPT and COURTEOUS attention concerning your career path. No mass mailing or high pressure sales! #1 employment counselor exclusively with database and CICS. Fox Morris is the nations largest corporate owned company with over 100 affiliates throughout the country. For a clear understanding of our clients needs call Robert Montgomery at (919) 872-2940 or send resume to:

[redacted]

SYSTEM CONSULTANTS

- SAN FRANCISCO BAY AREA -

These positions can bring Large Rewards, High Satisfaction, Major Challenges & Tremendous Growth.

SKILLS REQUIRED INCLUDE:

IMS, IDMS, CICS, COBOL, ALC, JCL with Mainframes, Minis and Micros.

LOGICAL OPTIONS
Incorporated Agency Est. 1975
San Market Plaza, Spear Tower, Suite 400-1A
San Francisco, CA 94105 • (415) 777-3000

Unix

National Registry of UNIX* job openings & professionals

P.O. Box 19049, Dept. CWU
Houston, TX 77224
Please send resume.

Scientific Placements, Inc.
800-231-3000

© Eastman Kodak Company, 1983

Software engineering at Kodak. Putting good things in small packages is one of our specialties.

From computerized manufacturing operations in the production of Kodak disc film to the design and fabrication of output driver chips for business systems equipment, computer professionals at Kodak excel at thinking small.

But Kodak's commitment to computer technology is big. Across the board, we have need for experienced, technically oriented computer scientists and software engineers.

Steady growth and diversification have created opportunities in a variety of areas, from system-level architecture to the development of software for real-time command and control subsystems in complex electromechanical hardware.

If you have the necessary skills and drive to meet the challenge of working for a corporation in the forefront of technology, send your resume today to:
Personnel Resources,
Eastman Kodak Company,
Dept. DCPW,
Rochester, NY 14650.

[redacted]

Kodak. The right place. The right time.

An equal opportunity employer manufacturing photographic products, fibers, plastics, chemicals, and electronic equipment. Plants in Rochester, N.Y., Kingsport, Tenn., Windsor, Colo.; Longview, Tex.; Columbia, S.C.; Batesville, Ark.; and a sales force all over the U.S.

DATA PROCESSING TECHNICAL SERVICES MANAGER

System/38 Environment

Challenging career opportunity with management responsibility for all technical requirements of an IBM System/38 shop located in metropolitan area of Eastern Iowa.

The ideal candidate must be creative, yet results-oriented and able to demonstrate in-depth knowledge and 2 years of significant hands-on experience with the System/38.

This position offers competitive compensation and an attractive benefits package. Forward confidential resume including salary history to:

SWISS VALLEY FARMS, CO.
Vice President of Personnel
P.O. Box 4493
Davenport, IA 52808

Equal Opportunity/Affirmative Action Employer

RESEARCH SCIENTIST

The Lawrence Berkeley Laboratory's Applied Science Division is seeking a research scientist to join its Building Energy Data group. The scientist will participate in the formulation, planning, and execution and evaluation of research in the areas of measured energy performance of buildings and equipment. Performs simulations of building energy performance of major computer buildings models (DOE-2, BLAST) in the course of modeling predicted energy use with measured energy consumptions. Supervises and coordinates of computer activities within the group, including development of data transfer protocols and software between mainframes, minicomputers, and PCs. Prepares publications for archival journals. Requires significant research experience related to energy efficient buildings and significant experience running building loads models, preferably with DOE-2 and BLAST. Requires familiarity and experience with VAX, Unix, and CDC operation systems. Prefer a degree in Computer Science and Master's degree in an energy-related field. Please send TWO resumes to Lawrence Berkeley Laboratory, Employment Office, Building 90 Room 1042, One Cyclotron Road, Berkeley, CA 94720. Please refer to Job #AS281. An Equal Opportunity Employer M/F/H.

LAWRENCE BERKELEY LABORATORY

DATA PROCESSING PROFESSIONALS CAREER OPPORTUNITIES

Looking to expand or enhance your career as a data processing professional? If so, Decision Consultants, Inc. (DCI) may be the firm you've been looking for. DCI has been providing professional software services for over 11 years. Our consultants are highly respected and continually in demand. Our enviable growth record and low turnover are a testament to the concern we maintain for each of our consultants. In addition, we offer an exceptional company paid benefit package including three weeks vacation, eight paid holidays, major medical, life, dental, prescription, tuition reimbursement and 401K salary savings plan.

We offer four geographic locations: Detroit, MI - Lansing, MI - Chicago, IL - Dallas, TX. Some of our immediate openings include programmers and analysts with two or more years experience in any of the following:

IMS DB/DC	IDS & DMV	IMAGE
IBM-PC	HONEYWELL	HP3000
MULTICS	UNIX	CICS
ORACLE	TANDEM	DEC/VAX/PDP
FOCUS/RAMIS	CAD/CAM	HOGAN
PROCESS CONTROL	'C'	

decision consultants inc.

Call or send resume to C.W. Whitaker
24601 Northwestern Highway, Suite 502
Southfield, MI 48075
313/352-8660

POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS

Lockheed-Georgia Company

DATA PROCESSING SPECIALISTS

Lockheed-Georgia has several long term programs whereby Data Processing Professionals can realize their fullest potential. Our facilities are located in Marietta, Georgia, an attractive community just north of Atlanta.

DATA COMMUNICATIONS - Position requires a minimum of three (3) years experience in designing and implementing data communications networks. Strong background in IBM, DEC and Tandem communications desirable. Experience in interfacing devices utilizing ASYNC, BSC, and SDLC protocols required.

IBM COMPUTER SYSTEM SOFTWARE SPECIALIST - Positions require two (2) or more years experience in system software support for Tandem TNS11/TXP or DEC VMS, RSX and RSTS, or IBM Series/1. Capabilities should include use of assembler languages, SYSGEN, local code changes, troubleshooting, BASIC, COBOL, FORTRAN, and data communications methods(s).

IBM COMMUNICATIONS SPECIALIST - Position requires a minimum of three (3) years experience in installing and maintaining ACF/VTAM and ACF/NCP with bi-sync and SDLC devices. Must be proficient in assembler language coding, network planning and debugging.

HARDWARE - IBM 3081, NAS 9070, 3725, 3274, 3705
SOFTWARE - MVS/SP1, ACF/NCP, ACF/VTAM, MSNF

IBM IMS/VS SYSTEMS AND DATA BASE SPECIALIST - Positions require minimum of three (3) years experience in installation and maintenance of IMS DB/DC products and technical support. Data Base design, control, and problem resolution are desired capabilities.

SOFTWARE - IMS/VS, DL/1, ADF, Data Dictionary

IBM MVS SYSTEM SOFTWARE SPECIALIST - Position requires minimum of three (3) years experience in support of large IBM mainframes using latest IBM software. Tasks include: SYSGEN, apply maintenance using SMP4, problem resolution, performance analysis.

HARDWARE - IBM 3081, and NAS 9070 mainframes
SOFTWARE - MVS-SP1, TSO/SPF, IMS, CICS, ACF2

The Lockheed-Georgia Company offers excellent salaries, comprehensive benefit program including Company-paid relocation to the Atlanta area. For immediate confidential consideration, please forward resume to:

LOCKHEED-GEORGIA COMPANY
Professional Recruiting
Dept. 90-31-432
Marietta, GA 30063

An Equal Opportunity/Affirmative Action Employer.

Lockheed -Georgia Company
LEADERSHIP IN TECHNOLOGY

Floating Point Systems, Inc. has exceptional opportunities for top caliber professionals. We are the world leader in the design and manufacture of Array Processors used in high speed scientific computing. We have these rewarding positions available:

Software Manager

Software group leadership responsibility for defining, scheduling and tracking new product development for an engineering group. Position requires extensive experience with major operating systems and drivers plus demonstrated project lead experience.

Technical Support Software Engineers

Provide software support to field engineers and customers. Work with engineering and other customer service groups to enhance and maintain product performance and serviceability. Requires strong software experience, knowledge of Fortran and ability to perform in a support role. IBM, DEC and/or other super-mini systems experience desirable.

Technical Writers

Write hardware/software manuals describing operating characteristics and theory of FPS products for use by customers and company personnel. Requires experience in relevant technical writing and a degree or equivalent experience in electrical engineering or computer science.

These positions are accompanied by excellent salaries and benefits plus the opportunity to enjoy the clean, green beauty of the Pacific Northwest. For prompt consideration, send your resume and salary history in confidence to: **Floating Point Systems, Inc., Attn: Employment, P.O. Box 23489 CW-28, Portland, OR 97223.**

If you have questions, call Employment of **1-800-547-8437.**

FPS FLOATING POINT SYSTEMS, INC.

We are an equal opportunity employer.

DATA PROCESSING OPPORTUNITIES
OKLAHOMA CITY LOCATION

If you are interested in working with a state-of-the-art computer system, The Hertz Corporation has outstanding career opportunities for you.

At our Worldwide Reservation Center in Oklahoma City, you will receive the ground floor opportunity to work on large scale software systems in support of our highly distributed field locations. We are expanding and currently have professional career opportunities available for:

CAPACITY PLANNING COORDINATOR

- Experience with Sperry 1100 Mainframes, preferably in a multi-vendor environment.
- Experience developing strategic plans.
- Experience in a high volume transaction processing environment.
- Experience developing statistical and modeling packages.

SYSTEM SERVICES MANAGER

- Five years experience in a Sperry 1100 Systems Programming environment, preferably in a multi-vendor environment.
- Experience in high volume transaction processing environment.
- Experience in system software development.
- Good organizational skills and a proven level of accomplishment.
- Prior successful supervisory or management experience of the systems programming function.

SYSTEMS PROGRAMMER

- Two or more years experience in a systems programming role on Sperry 1100 equipment.
- Ability to generate, troubleshoot, and provide user support in one or more of OS-1100 (EXEC 8), CMS, and/or the processors.
- Good organizational skills.

APPLICATION PROGRAMMERS

- Univac 1100 Mainframe experience
- COBOL
- Assembler
- TIP

These positions offer competitive salaries, relocation assistance and excellent benefits. Please submit both your resume and salary history to:

THE HERTZ CORPORATION
Attn: Don Barnes
10601 N. Pennsylvania
Oklahoma City, OK 73120

80E MFANV

WE NEED YOUR HELP

SECURITY ENGINEER ..... 50K+
Develop computer security system in VAX-UNIX environment.

MIS DIRECTOR 75K
Utilities background-big IBM.

BANKING SYSTEMS 45K
HOGAN-CPCS-ACH experience or develop new systems.

SYSTEMS PROGRAMMERS ..... 45K+
MVS or VM or DS internals. Capacity plan-perf meas.

DATA BASE ANALYST ..... 45K+
IMS-IDMS-ADABAS-IDS-IDMS

SCIENTIFIC PROGRAMMERS . to 50K
BS read - Develop new software on mini and mainframe. Communications, ADA or PL/M a plus.

Regional Information Center Assistant Director

Salary $27,993.36-$37,110.02

Graduation form an accredited 4 year college or university with a BA/BS in computer science, mathematics, engineering, business or related field, and 5 years progressively responsible experience in data systems of which 3 years must include supervisory experience.

Send resume to:

Alachua County
Personnel Office
PO Box 1467
Gainesville, FL 32602
(904) 374-5216

An Affirmative Action
Equal Opportunity Employer

OUR GROWTH MEANS OPPORTUNITY FOR YOU!

The continued success of our branch operations in Buffalo, NY and Tampa, FL and new our new Baltimore, MD branch translate to exciting opportunities for the following professionals in state-of-the-art environments nationally:

Mbr Spt And Lg IBM or Burr	to $40K	PA 3 yrs PL1	to $40K
Sr PIA Banking COBOL-IMS	to $35K	Sr Consult-Healthcare	to $40K
Sys Anal MBA Prog Exp	to $35K	Prof Mgr DOS/VSE-DOS	to $35K
Mgr Applications Bank	to $35K	PVA PM Software	to $35K
PA 2 yrs DBC Basic	to $35K	Sys Prog IMS Internals	to $35K
Sthern Reg Mbr IMS, ADA, Assem	to $40K	TP Network Mgr	to $35K
Sys Prog DL/M/I	to $40K	Realtime Prog-DEC Assem	to $40K
PIA COBOL-Lmdg	to $35K	Sys Prog - MVS	to $40K
Sr PIA IDMS/VOS3	to $35K	PIA IMS London Assignment	to $35K
Sys & Prog Mgr MAPCS	to $35K	Sr PIA mfg - COPICS	to $35K
BA PC to Mainframe	to $35K	Sys Prog Performance Acctg	to $40K
Sys Prog VTAM/NCP	to $40K	PIA COBOL-utility Industry	to $35K
Sr PIA Bus-PL1	to $35K	PIA 3000/70, SPT	to $35K
CPS And UCC-1, ACF2	to $35K	Sr PIA Tandem, TAL	to $35K
Dir Sys Dvlpt Banking	to $70K	Sys Prog VM	to $40K

COMPUTERPEOPLE

1100 Delaware Ave.
Buffalo, N.Y. 14209
(716) 883-0771

Executive Plaza II, Ste. 701
11350 McCormick Rd.
Hunt Valley, MD 21031
(301) 666-8822

5402 Bayshore Central Blvd.
Suite 108
Tampa, FL 33611
(813) 835-0135

ANALYST/PROGRAMMER

An exciting opportunity to become a member of the systems development team at Case Western Reserve University. Our role is to provide modern management systems to all parts of the University. We need competent analyst/programmers dedicated to quality and user satisfaction to deliver on-line, data base systems. If you agree with our direction and have 2-3 years experience on large system DEC equipment, do write stating your qualifications.

CASE WESTERN RESERVE UNIVERSITY
Human Resources
10900 Euclid Ave.
Cleveland, OH 44106

We are An Equal Opportunity/Affirmative Action Employer M/F/H

Never mind the sophisticated hardware and great salaries. It's what an overseas assignment can do for your career that really counts.

Allied Medical Group (AMG) are leading British health care consultants to the large and prestigious Riyadh Al-Kharj Hospital Programme in Saudi Arabia.

The multi-machine installation that serves the 660 bedded hospital has a network which serves the total patient and management information, laboratory, engineering, accounting and administrative needs of two of the Kingdom's most prestigious military hospitals.

Its hardware consists of an array of kit from top manufacturers including a Honeywell L66/10, 3 x HP 3000 (soon to include a Series 48) and a CDC CYBER 18/20. Existing software used includes: IDS1, TDS, GCOS3, GMAP, VPLUS, IMAGE, VIEW, COBOL, FORTRAN and SPL. "State-of-the-Art" software is soon to include fourth generation technology such as QUICK, QTP and QUIZ.

The Programme is at a very exciting stage and is in the process of preparing a long range computer strategy which will involve a major expansion of the network. We are looking to recruit two enthusiastic and dynamic computer professionals who will be able to play a major part in developing and supporting applications in close collaboration with the users.

Project Team Leader

(Hewlett Packard)

You'll be responsible for the supervision and control of the teams involved in the development, implementation and maintenance of the HP 3000 equipment. You will need in-depth knowledge of IMAGE, VPLUS, COBOL and preferably SPL, and experience with fourth generation tools such as QUICK, QTP and QUIZ would be a great advantage, as would experience of on-line hospital patient care systems.

For this post we seek someone with at least eight years experience including three in systems analysis/design, and two in project management and you'll need to show that you have developed and successfully implemented at least two major systems in the past.

This is a married status post.
Ref: P/RKH/3033/CW.

Programmer/Analyst

Working to the Project Team Leader, you will be involved in producing the source language coding necessary for the development of the new computerised information systems and the maintenance/modification of existing systems and programmes. You will also assist in system testing and implementation and participate in user and computer staff training.

You'll need to have at least an HND, or equivalent, and four years programming/analyst experience on the languages currently being utilized within the Computer Department.

This is a single status post.
Ref: P/RKH/3096/CW.

As well as a very generous salary and end of contract gratuity, the benefits package for these 2 year contract basis posts includes: free, fully furnished accommodation; four weeks leave for every six months service; free air fares (including leave flights) and extensive welfare and recreation facilities.

So, for further details about how to enhance your future career prospects, please write, enclosing a full c.v. and quoting appropriate reference number, to: Theresa Sutherland, Senior Personnel Officer, Allied Medical Group, 12/18 Grosvenor Gardens, London SW1W 0DZ ENGLAND.

Allied Medical Group

In Software Development the alternatives are many, but the choice is clear.

For a quarter century, one company has been clearly recognized as the leader in software development. Year after year, Applied Data Research continues to define and redefine "state-of-the-art" for the software products industry. Our leadership is evidenced by our success in the development and sale of the most widely accepted and highly advanced IBM mainframe and microcomputer products.

ADR is continuing to create many new and interesting positions for qualified individuals who are seeking greater challenges and increased rewards in their endeavor for career growth. Currently, we have positions available in Princeton, NJ and Dallas, TX for persons experienced in the following:

- **SYSTEMS SOFTWARE DEVELOPMENT**
  - 4th Generation Languages
  - Data Base Management Systems
  - Word Processing/Electronic Mail
  - Performance Measurement/Capacity Planning
  - PC/Mainframe Communications
  - Operating System Extensions
- **TECHNICAL SUPPORT SERVICES**
  - Data Base Administrators and Consultants
  - MVS/DOS/VM Technical Support
  - Systems Programmers (MVS/VTAM/NCP)
  - Systems Analysts/Programmers (DB/DC)
  - Human Factors

ADR offers a comprehensive benefits package, liberal relocation assistance and compensation fully commensurate with your experience. For consideration, please forward your resume or call Gary Jabasoo, (201) 874-9000, APPLIED DATA RESEARCH, INC., Route 206 & Orchard Road, CN-8, Princeton, NJ 08540.

APPLIED DATA RESEARCH

An Equal Opportunity Employer

SENIOR DEVELOPMENT PROGRAMMER IN BEAUTIFUL VERMONT

Position available in expanding, established software development firm. Must have at least two years experience in systems programming or in either 68000 or 8088 assembler languages. Macintosh programming experience, micro-mainframe communications, and good PASCAL a major plus. Must be able to plan and program software systems.

Salary commensurate with experience. Fulltime, available now. Send resumes and 3 references to:

Tom Evelin
Solutions, Inc.
Box 969
Montpelier, VT 05602

CICS PROGRAMMER ANALYST

Excellent opportunity for an experienced CICS/DOS Applications Programmer. St. Louis-based financial organization seeks your expertise in CICS applications. Excellent potential for advancement in this highly visible position. Excellent bonus plan & relocation. Salary to $35,000. FEE PAID.

Randy Pope or Werner Calloway

ROBERT HALF OF ST. LOUIS
7733 Forsyth Blvd.
St. Louis, MO 63105
(314) 727-1000

IBM 38

Programmers, Programmer Analysts with 1 year plus experience – Let us update you on the rapidly changing IBM 38 market coast-to-coast. To confidentially explore exciting new career opportunities, in your own state or nationally rush a resume or call Dianne Geer.

DUNHILL OF ALBUQUERQUE, INC.
1717 Louisiana NE, Dept. C
Albuquerque, NM 87110
(505) 262-1771
Exclusively Employer Retained

SYSTEMS PROGRAMMERS

Commercial Union is a world wide property/casualty insurance company whose U.S. corporate headquarters are located in downtown Boston. Our challenging state-of-the-art technical environment includes: 308X processors, MVS/XA, 3380 DASD, JES 2, VTAM, CICS, TSO; VAX 11/780 processors, VMS, UNIX, multi-cets, etc.

Several opportunities exist within our Technology Group for individuals to provide system software support, assist in planning, coordinating and implementing software.

The persons we seek should possess 2+ years experience in large scale IBM systems software in the following disciplines:

- MVS/SP (XA preferred), JES 2, SMP-E, VM/CMS, RSCS, RACF/ACF 2, etc.
- Installation/maintenance of system application products.
- Problem determination/resolution skills; operational familiarity.

CU offers professional growth, competitive benefits and a relocation package to a city offering a variety of educational, cultural, recreational, and entertainment opportunities. We are convenient to all forms of Mass. transportation for Boston and surrounding suburbs.

For consideration, send resume and salary history to: Kathy Zabretsky, Commercial Union Insurance Companies at the address below. Agencies respond in writing only. We are an equal opportunity employer, M/F.

CU Insurance

MIS PROFESSIONALS

Managerial and Supervisory Opportunities for Expanding IBM Multiprocessor Data Center in Florida

The MIS Department of GOULD INC., Computer Systems Division is expanding its Data Center at Divisional Headquarters in Florida. We operate dual IBM 4341's in a VM/DOS/VSE environment, with a large VTAM/CICS network. The following key positions are immediately available.

DATA CENTER MANAGER

You'll be responsible for managing a three shift/seven day Computer Center Operation, including systems programming, data entry, data control and quality assurance. The successful candidate will be an innovative leader with excellent organizational skills and will have a demonstrated record of successful management experience in mid to large multi-shift IBM environment. Experience with telecommunication networks also required. College degree is preferred.

Project Leaders

MANUFACTURING SYSTEMS **FINANCIAL SYSTEMS**

We are also staffing two key supervisory positions in the above areas. Candidates for both positions should have proven supervisory experience, excellent user interface skills and a strong background in an IBM, DOS, COBOL and CICS environment.

Candidates for Manufacturing Systems should have significant manufacturing systems experience. APICS certification and/or knowledge of MRP II/closed loop philosophy is a plus.

Financial Systems candidates should have several years of experience with financial applications in a manufacturing environment.

GOULD INC., Computer Systems Division is the price/performance leader in the 32-bit super minicomputer marketplace. Our home, Plantation, Florida is one of the fastest growing, cleanest hi-tech cities in Florida. As a suburb of Ft. Lauderdale, you'll find the convenience and excitement of a major city with the relaxing lifestyle of suburban living. And, with no state income tax, the cost of living is in your favor.

For immediate consideration forward your resume including salary history to GOULD INC., Computer Systems Division, John DePrima, Dept. CW1126, 6901 W. Sunrise Blvd., Ft. Lauderdale, FL 33313. An Equal Opportunity Employer, M/F/H/V.

GOULD
Electronics

SUNBELT

TECH SUPPORT IBM ONLY

Systems Programmers 28K-45K

CAPACITY PLANNERS 30K-42K

TANDEM 25K-35K

Positions are available throughout the Southeast. Client companies assume all fees including interviewing and relocation expenses. Call me and let's talk about what's available. No obligation. No contracts. Total confidence assured. Resumes or call:

BILL DENNY
PRESIDENT
1-800-874-9004

Advanced Recruiters INC.

P.O. Box 17489
Jacksonville, FL 32245-7489

DATA BASE ANALYST

Edward D. Jones & Co. is a St. Louis based financial services firm with over 700 offices nationwide. We are expanding our DBA staff to keep pace with the firm's growth.

Our data processing department is state-of-the-art in hardware and software with multiple IBM 3083's CICS, VTAM, MVS/XA and IDMS.

Responsibilities will include design and implementation of database systems as well as providing database related assistance to the programming staff.

Requirements include a minimum of 3 years database design experience with IDMS. A Bachelor's or Master's degree will be a plus.

For consideration, send your resume, in confidence, to Human Resources Department, Edward D. Jones & Co., 201 Progress Parkway, Maryland Heights, MO 63043

Edward D. Jones & Co.®
Members New York Stock Exchange, Inc.
"Members Securities Investor Protection Corporation"

EQUAL OPPORTUNITY EMPLOYER

SYSTEMS PROGRAMMERS

KARSTEN MANUFACTURING CORPORATION, a nationally known sports equipment manufacturer, has openings for two Systems Programmers.

Responsibilities will include:

- Systems software installation and maintenance
- System tuning
- Performance management

Qualifications:

- Minimum two years experience with the IBM VM operating systems software and associated program products
- CADAM experience a plus

Competitive wage and benefits package. Send resume with salary history in confidence to Bud Gingerich, Data Processing Coordinator.

"For those who want to play their best."™

KARSTEN® PING®

Post Office Box 9990
PHOENIX, ARIZONA
U.S.A. 85068

Phone (602) 277-1300

NATIONAL GOLF FOUNDATION MEMBER

Manager of Programming and Development. Coordinate and participate in the development of computer programming to support of our trading operations. Analyze requests for information received from management, customer representatives, or due to changing corporate reporting requirements. Determine the best method of satisfying these requests. Write programming specifications and/or conduct I-O and test to ensure success. Schedule and assign work to subordinates in response to changing work flow situations. Must have at least 3 years of college in data processing or computer science. Must have at least 4 years experience in the job duties or 4 years experience as Project Leader of a computer programming group. Must have 3 years experience (these may be concurrent) in/with each of the following: SyFA computer systems, basic programming skills, SYSOL computer language, thorough knowledge of a cdr trading system with respect to it computer systems, and operating understanding of SyFA computer. Work 35 1/4 hrs/wk. Salary $41,000/yr. Send resumes to New York State Dept. of Labor, 344 Fulton Ave., Hempstead, NY 11550, J.O. #0070185, DOT Code 020.167-018.

DATA PROCESSING PROFESSIONALS

"COME TO WHERE YOUR FUTURE IS"

Why settle for less than the best positions for programmers, analysts, systems programmers? We specialize in both regional and national markets, working with prestigious Fortune 500 companies. Call, send a resume or business card for a confidential - no obligation listing of our top "50" career opportunities.

All employment costs, including relocation, assumed by client companies.

Performance-guarantee, self or send resume including salary to candidates for:

Atlanta, GA 30340 47 Perimeter Center East, NE Suite 940 Dept C — 404/393-4000 S. Hosford
Charlotte, NC 28211 542 E. Tyvola Suite 1100 Dept C — 704/376-0200 C. Hunter / L. Stone
Raleigh, NC 27609 3101 Poplarwood Court Suite 310 Dept C — 919/878-0310 R. Montgomery

FOX•morris
personnel consultants

POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS

IDMS 30k - 50k

A young and growth recycling company seeks four 2+ years of IDMS expertise to support revised development projects starting early '85 in western states with Wang units.

SYS. PROG. with solid MVS background to install, maintain & fine tune IDMS.

DBA for logical & physical database design, maintain IDS & IDMS utilities. Must be a good communicator. 5+ yrs IDMS.

ADS/O ANALYST to design & code maint & change for application systems. 3+ yrs ADS.

APPLIC. PROG. experienced in structured coding & debugging of COBOL, PL/I & ADS/O applications for IDMS environments.

Work for us as a consultant or we can place you in a permanent position with one of our clients, your choice. We specialize in IDMS jobs, both and offer competitive salaries, bonuses, life insurance, sick leave & vacation, education plan, profit sharing and stock options benefits for our employees. We also contract with users who have a good track record. 3+ yrs IDMS and 5+ yrs EDP.

Please your resume or call us:

Marel, Inc.
P.O. Box 198,
Issaquah, WA 98027-0198.
206-746-0401

(no agencies please)

SPERRY (UNIVAC) 1100 EXPERIENCE

We currently have a serious shortage of experienced Sperry (Univac) 1100 individuals for our clients nationwide.

If you are interested in hearing about the many opportunities we have available please call our toll free number or register your resume with:

Mike Badgett
Dunhill of Cherry Hills Village, Inc.
11100 E. Bethany Dr.
Suite 1420-B
Aurora, CO 80014

1-800-621-8385
EXT: 371

NATIONAL SPERRY (UNIVAC) RECRUITERS

We're Hiring
Data Processing Professionals

Central and South West is a two plus billion dollar electric utility holding company offering competitive salaries, excellent benefits and stable working conditions. Our Information Services Department, as host center, provides services in a multi-company environment.

Our primary system software is MVS/SPI with JES2. Additionally we use TSO/SPF, COBOL ROSCOE, and Command Level CICS. Our data base is IDMS. We were recently chosen to be one of Cullinet's beta sites for their new development software! We use Cullinet's 4th generation languages—ADS/O, OLM, CULPRIT, etc.

Each of our current openings needs people with proven analytical skills and user interface experience in addition to technical knowledge and abilities.

If we're the type of company you are seeking, and your experience is from a similar environment, please send your resume *and* salary requirements to the Employee Relations Department. Principals only.

Programmer/Analyst (Business Applications)
Typical project assignments include construction project management, land management system, corporate shareholder system, etc.
Will provide technical expertise in system design, problem determination and system maintenance efforts. Should have JCL skills and online experience (CICS, VSAM) plus exposure to data base concepts.

Sr. Programmer/Analyst (Engineering Applications)
Multi-project assignments offering multi-company exposure will include CAD/CAM, VM/CMS, transmission design, etc.
Will provide scientific/engineering expertise in system design and implementation efforts. Should have prior scientific/engineering application experience plus IDMS experience.

Programmer/Analyst (Engineering Applications)
Initial assignment to the mining information management project will result in the development of a total, stand-alone system using state-of-the-art technology
Will provide online and data base technical expertise in system design and problem determination efforts. Should have related technical skills developed from manufacturing related assignments. IDMS, ADS/O experience important.

Central and South West Corporation
PO Box 2000 • Dallas, Texas 75202

Central and South West Corporation is one of the nation's leading electric utility systems, having annual revenues of more than $2 billion. With corporate headquarters in Dallas, CSW serves more than four million people through its operating companies in Texas, Oklahoma, Arkansas and Louisiana.

Equal Opportunity Employer

EXPERIENCE THE PRIDE OF OWNERSHIP

EASTERN AIRLINES has the following openings at its Miami Computer Centers:

ACP/PARS PROGRAMMERS

We're looking for software development experience using airline control language for transaction processing systems. (Position RM1)

BAL PROGRAMMERS

We seek individuals with a minimum of 1 year of IBM Assembler experience to be trained in PARS software. These positions offer the opportunity to learn sophisticated software development using transaction processing technology. (Position TO1)

PL1 PROGRAMMERS

A minimum of 2 years PL1 experience in an OS/MVS environment with JCL is necessary. (Position JD1)

Working for Eastern Airlines can open up a new world for you. We offer world-wide travel privileges, excellent company paid health benefits, attractive salaries and tremendous career growth opportunities. Living in Florida offers a sun-filled, casual year-round outdoor lifestyle with no state/city income taxes. If you're counting on a great future, count yourself in at Eastern.

To apply for any of these positions, please refer to the code letters in parenthesis at the end of each position description. Send detailed resume, including salary requirements, to: EASTERN AIRLINES, Management Recruiting, Department VO, International Airport, Miami, FL 33148.

EASTERN
We earn our wings every day™

Equal Opportunity Employer M/F

ANALYST/ PROG./I.C./ COMM.

Our Fortune 500 hi-tech R&D/mfg. client in the NY Southern Tier area has new data center. Exciting oppty's. now exist for IBM/Honeywell trained proc. programmers, analysts, data comm., sys. (MVS-VM) prog., database admin. & info. center analyst/mgr. Hiring to happen before yr. end! Beautiful community w/extraordinary quality of life. To $43,000.

ROBERT HALF OF BUFFALO, INC.
420 Main Street
1310 Liberty Building
Buffalo, NY 14202
(716) 842-0801
Personnel Agency

COMPUTER SYSTEMS ENGINEER

Responsible for supervising and maintaining computing facilities for the Department of Computer Science. Hardware consists of a VAX 11/785, PDP 11/44 and various types of micro computers. Qualifications: strong technical knowledge of software systems including the development and modification of software to suit local needs; knowledge of applications software interfaces in a time sharing environment; knowledge of 1 or more higher level programming languages; experience in repair and maintenance of computer hardware. Data base knowledge helpful. MS in Computer Science; experience with UNIX and C, and eagerness to keep up with the activities in computer science preferred. Salary $25,394. Excellent benefits including educational aid, paid retirement, group life insurance, health care, vacation and sick leave. Closing date December 14, 1984. Send letter of application and resume to:

Employment Office
Old Dominion University
1999 West 46th Street
Norfolk, VA 23508

ODU is an Equal Opportunity Institution

R&D POSITIONS IN THE PACIFIC NORTHWEST

BATTELLE, a leader in research and development, has opportunities available for experienced computer scientists and engineers. The following positions require a B.S. degree in Computer Science or Electrical Engineering. An advanced degree is desirable.

DATABASE/GRAPHICS RESEARCHER - Duties include the design and development of innovative graphical techniques, data management, and user interfaces for analyzing large complex data sets. PhD desirable.

AI/EXPERT SYSTEMS RESEARCHER - This position involves the development of expert/knowledge based systems for a variety of applications including process control, robotics, computer/user interfaces and demographic data interpretation.

HUMAN FACTORS ENGINEER - Duties include the design and development of computer/user interfaces and expert systems.

SIGNAL/IMAGE PROCESSING ENGINEER - Duties include the development of signal processing, pattern recognition and image processing methodologies for nondestructive testing, manufacturing automation, inspection systems, and robotics.

U.S. Citizenship required.

We offer excellent opportunities in career development, professional atmosphere, excellent salaries and benefits. Send confidential resume including salary history to: Lanae Henderson, Battelle Northwest, P.O. Box 999, Richland, Washington 99352. We are an equal opportunity employer.

Battelle
Pacific Northwest Laboratories™

POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS

COMPUTER OPPORTUNITIES

Salt Lake City, Utah

Hercules Aerospace Company, a leader in the areas of solid fuel propulsion systems, development and production of graphite fiber and composite structures, presently has career opportunities for experienced computer professionals.

BUSINESS

BUSINESS PROGRAMMER/ANALYSTS

Candidates should have a BS in a computer related field and a minimum of 2 years experience on large IBM mainframes with emphasis on COBOL, IMS and TSO. Excellent communication skills and the ability to interface with user departments are a must.

SYSTEMS PROGRAMMERS

Requires basic knowledge of assembler language and 2 plus years in one or more of the following: MVS/XA, MVS/370, TSO, JES 2 and/or IMS. Currently operating MVS/XA on a 3084Q with expansion program to include additional IBM computers.

SYSTEMS PROGRAMMING SUPERVISOR

Requires BS in a computer related field and 5 plus years with large IBM systems (MVS/XA, MVS/370 and/or IMS/VS). Ideal candidate will have management/supervisory experience and a technical degree.

SCIENTIFIC

ELECTRONIC ENGINEERS

BSEE or EET and 2 to 5 years of experience working with control systems to solve automation problems using 68000 or 8080 technology. Experience with assembler and "C" language for mini/micro computers is desirable.

MATH MODELING SPECIALIST

MS or Phd Physics, Math or Computer Science with knowledge in all three areas. Individual will analyze and develop large scale computer simulation systems. Must be skilled in differential equations, 3-D geometry and FORTRAN programming. Mathematical models will be used for filament winding of asymmetric 3-D surfaces with multi-axis winding machines.

PROGRAMMER/ANALYSTS

BS ME, CE, ChemE with capabilities in numerical methods and computer graphics technology. IBM mainframe and FORTRAN experience with graphic language skills desirable. Interactive techniques are used to support engineering design and analysis systems. Familiarity with Apollo work stations would be a plus.

SOFTWARE ENGINEERS

BS in a technical field with a minimum of 2 years experience in real time applications, data acquisition, laboratory automation or robotic control systems. Individuals should be experienced with DEC PDP-11 RT/RSX operating systems and 68000 technology or have FORTRAN experience on IBM or Honeywell (CP-6) mainframes.

Hercules offers excellent salary, complete benefits and the opportunity for career advancement. Salt Lake City provides abundant recreational and cultural attractions, reasonable housing costs and an exceptional quality of life. If you meet the above qualifications, send a complete resume including salary history to: Al Bakke, (Business) or, Jim Jaquin (Scientific).

HERCULES

Hercules Aerospace Company
Aerospace Division
P.O. Box 98
Magna, Utah 84044

U.S. Citizenship Required. An Equal Opportunity Employer M/F

UNIX*/C

$25,000 to $80,000

APPLICATIONS & SYSTEMS

National Placement Leader
For UNIX/C PROF'Ls
000 OPENINGS NATIONWIDE
Call or send resume

J. ROGERS ASSOC

NJ (000) 000-0000
out of state 000-000-0000
100 Franklin Corner Rd-Dept C-D
Lawrenceville, NJ 08648

*UNIX is a trademark of Bell Labs

Computer Applications Engineer

For packet interconnect technology and distributed operations systems. Requires a PhD in Computer Science with one year predoctoral experience as a Computer Applications Engineer specializing in fault tolerant distributed operations systems and concurrency control. 40 hours per week (work schedule: 7:45am to 4:30pm). Salary is $46,000 per year. Send resume to: 0072246 - OBES - 3434 Cleveland Ave., Columbus, Ohio 43224.

COMPUTER WORLD

The Recruitment Connection...

... the best connection to have when you are looking for quality computer professionals. There is a good reason why COMPUTERWORLD is the number ONE computer industry trade newspaper. No other newspaper of its kind can give you the broad exposure that you will get by advertising in COMPUTERWORLD. It is read by over half a million people, most of them top-notch professionals with top-notch computer companies.

COMPUTERWORLD publishes every Monday and the deadline for receiving your advertisement is always ten days prior to the issue date desired. The open line rate is $9.15 per line with a minimum size of 2 column inches. Send in either camera-ready material or clearly typed copy with a layout if desired. We also have a telecopier service and ad-takers who will gladly take copy over the phone.

Our mailing address is

COMPUTER WORLD
Classified Advertising
375 Cochituate Road
Box 880
Framingham, MA 01701

Or call
for more information at
1-800-343-6474
or, in Mass.
(617) 879-0700

COMPUTER WORLD
The best connection to have.
The only connection you'll need.

COMPUTER APPLICATIONS PROFESSIONALS

Southern California

CF Braun & Co, a worldwide leader in the engineering and construction industry, has immediate openings in our Engineering Systems Center. Our computer network, centralized in our Alhambra, California headquarters, is linked to our offices and job sites throughout the world.

Electrical Engineering Programmer/Analyst

Position requires a BS in electrical engineering and a minimum of 2 years programming experience in ALGOL and FORTRAN languages on a mainframe computer. Experience in power system design is preferred. Individual will participate in the conversion of an electrical system from Burroughs to IBM 3081.

Autodrafting Programmer/Analyst

Position requires a BS in computer science or engineering, a good command of FORTRAN and experience on large mainframe. MVS operating systems and experience in graphics is desirable. Responsibilities include using the autodrafting system to support piping engineering in the production of isometrics. This includes daily interface with the Piping Coordinator to detect and identify problems. Will also participate in developing an interactive graphic system for piping engineering application.

Braun offers an attractive employee benefits program: life, medical, dental and accident insurance, a two-way retirement plan, profit sharing, investment savings plan, and more. At Braun, we work 4½ days a week with Friday afternoon off.

Send direct replies only to:

John Wells
1000 S. Fremont Avenue
Alhambra, CA 91803

Equal Opportunity Employer

BRAUN
C F BRAUN & CO

Contract Programmers

Top Rates - Long Term

Two or more years experience needed in one of the following:

- Compiler Design or Testing
- ADA (one year experience)
- Computer Architecture Simulation

These are full time openings. Call or send resume to Dave Iacarella.

Office Information Systems, Inc.
10600 Lyndale Ave. S.
Minneapolis, MN 55420
(612) 884-9199

SR. SYSTEMS ANALYST for ALUMNI and PUBLIC AFFAIRS

Dartmouth College

Candidates should have thorough knowledge of distributed processing, data base management, mini and personal computers in a market-oriented user application. Experience in conversion of applications systems from batch to on-line. Excellent interpersonal and writing skills, ability to coordinate training programs. Bachelor's degree with 4-6 years' systems analyst experience or Master's plus 2-3 years' related experience or equivalent.

Resumes, stating salary requirements, before December 10, 1984 to Linda MacDonald, Executive Officer, 111 Blunt, Dartmouth College, Hanover, NH 03755.

Dartmouth College is an affirmative action/equal opportunity employer

Senior EDP Auditor

Large electric utility corporation with centralized data center and four remote sites is seeking an experienced Senior EDP Auditor. Job responsibilities include:

- Participate in development of annual EDP Audit Plan
- Prioritize and schedule assigned audit projects
- Plan and accomplish or supervise accomplishment of assigned audit projects
- Review fieldwork performed by subordinates
- Prepare or review resulting audit reports.

Should have professional certification and B.S. in Computer Science or business related field with minimum of three years EDP Audit experience in an MVS environment utilizing ACF2, TSO, ROSCOE, CICS and IDMS.

Please mail resume and salary requirements to the Employee Relations Department. Principals only.

Central and South West Corporation

P.O. Box 220164 • Dallas, Texas 75222

Central and South West Corporation is one of the nation's leading electric utility systems, having annual revenues of more than $6 billion. With corporate headquarters in Dallas, CSW serves more than four million people through its operating companies in Texas, Oklahoma, Arkansas and Louisiana.

Equal Opportunity Employer

DATA PROCESSING OPPORTUNITIES

Juneau and Anchorage, AK

DATA BASE ADMINISTRATOR
Salary: $47,500 to $52,000/year plus benefits

The State of Alaska has a current vacancy located in Juneau. This is a supervisory position with responsibility for the development, analysis, design control and management of the State of Alaska data base systems.

Minimum qualifications are: three years of data base management systems experience on a system equivalent in size and complexity to IBM, IMS, Total Systems 2000, RAMIS, IDMS, or ADABAS, including one year of experience equivalent in kind and level to Data Base Specialist with the State of Alaska. PLUS three additional years of computer programming and/or systems analysis experience.

Note: The State's DBMS is ADABAS and preference is given to applicants with ADABAS experience.

DATA BASE SPECIALIST
Salary: $43,500 to $47,500/year plus benefits

Open recruitment in underway in order to find additional qualified candidates in the event of future openings. Positions are located in Juneau and Anchorage, and perform the full range of data base requirements in support of user activities. These include DBMS design, definition, organization, security, efficiency, documentation, generation, long term requirements, and operational guidelines.

Minimum qualifications are: two years of data base management system experience at a level equivalent to Systems Analyst II, EDP Programmer IV, or Systems Programmer II with the State of Alaska on a system equivalent in size and complexity to IBM, IMS, Total Systems 2000, RAMIS, IDMS, or ADABAS.

One year of experience listed above must have been in the analysis and design of data base applications and/or data base administration. PLUS at least three additional years of computer programming and/or systems analysis experience.

Send official State application or resumes to: Recruitment Coordinator, Pouch C-0201, Juneau, AK 99811.

THE STATE OF ALASKA IS AN EQUAL OPPORTUNITY EMPLOYER. WOMEN AND MINORITIES ARE ENCOURAGED TO APPLY.

State of Alaska

NEW ORLEANS

Spicy! That's the flavor of New Orleans. New Orleans provides its residents an enviable lifestyle. Great restaurants, a warm climate, and world renowned celebrations, such as Mardi Gras and the New Orleans Jazz and Heritage Festival, have kept New Orleans the Queen city of the south.

But New Orleans is much more than a great place to live. It's a great place to further your Data Processing career. New Orleans is the home of MIDDLE SOUTH SERVICES, INC., the service arm of the Middle South Utility System.

MIDDLE SOUTH SERVICES is currently involved in several projects including large scale IMS DB/DC systems development. The current hardware environment consist of IBM 3084, 3081, MVS/XA, 4361 VM, and Tandem. We have the following excellent career opportunities:

PLANNING AND CONTROL ANALYST A current opening exists in our Planning and Control section for an Analyst to work on the implementation and training of a systems development methodology package. The ideal candidate will have a B.A. in Business and 2-3 years experience in a computerized environment monitoring compliance with systems development standards, with an emphasis on planning and control. Experience in development of methodology is a strong plus with experience on methodology software packages.

ANALYST/PROGRAMMER (SCIENTIFIC) Requires previous experience in scientific applications with a sound knowledge of PL-1 or Fortran. Computer applications development with exposure to a VM operating system would be helpful.

ENGINEERING SYSTEMS ANALYSTS As a member of the power systems planning team you will be directly involved in program development and ongoing support to the Power System Planning Group. Programs used by this group are for planning future transmission and generation. Requires BSEE degree and minimum 2 years experience in application and program development.

ANALYST/PROGRAMMERS Position involves the development of various Business applications using COBOL or PL/1. Knowledge of IMS DB/DC and ADF is considered a plus. Large IBM OS/MVS experience required.

IMS SYSTEMS ANALYST Position involves systems analysis in a large scale multi-user IMS DB/DC environment, logical Data Base Design, utilization of TRANSFORM applications generator, testing and debugging on-line IMS programs, and development of reusable field update logic in data management transactions.

SYSTEMS PROGRAMMER, PROGRAM PRODUCTS Positions involve the installation and maintenance of various program products. The position requires two (2) plus years of program products installation and maintenance experience, plus experience working with SMP-4 or SMP/E.

Middle South offers an exceptional Relocation Package including:
Relocation Allowance (One Month's Salary)
Paid Moving Expenses
Paid House Hunting Trip
Mortgage Interest Differential plus Interim Living

We offer an excellent benefits Program and Compensation Package. For more information contact Joe Hotard, Byron Heath or Gary Silbert:

1-800-231-4481
or send resume to:
MIDDLE SOUTH SERVICES, INC.
P.O. Box 61000, NEW ORLEANS, LA 70161

MIDDLE SOUTH SERVICES INC.
An Equal Opportunity Employer M/F

MANAGER OF PROGRAMMING
— $60,000 —

Strong VMS exp coupled with IBM PC bridge will enable you to jump into this very exciting position supervising 5 Programmers. Report directly to President. FEE PAID.

ROBERT HALF
and other specialties

[illegible] Avenue
New York, N.Y. 10022
212-371-0000 (Agency)

New England, Westchester & NY Metropolitan Area

Permanent and/or Independent Consulting

INT'L BANKING • FUNDS TRANSFER
ON-LINE BROKERAGE • CIRCUIT PROC.

VAX-BASIC, BURROUGHS-DMS, ALGOL, COBOL, IBM CICS, MACRO & COMMAND; MICROS, HONEYWELL, COBOL: Level 6, TPS-screen write, Level 6, DMIV, TP; MULTICS: IMS, Dibase II, SERIES I, PL1

Openings at all levels in any of the above. Call Maggie Lipton, 212-307-0000 or submit resume to Interface Inc., 17 West 54 St, NY, NY 10019.

PROGRAMMER/ ANALYST
Greensboro, N.C.

Your IBM System 38 experience is your key to an exceptional career with a growing fiber products company, FACET ENTERPRISES, INC.

We have an immediate career opportunity for a Programmer/Analyst with at least one year of IBM System 38 experience. The ideal candidate will have a background that includes RPG III and experience with MAPICS manufacturing applications.

We offer a state-of-the-art environment plus numerous opportunities of advancement. And our Greensboro, NC location, rated the #1 place to live in the U.S., will afford you and your family a full range of cultural and recreational advantages. In addition, we offer a highly competitive salary and benefits package. For prompt consideration, send your resume to:

FACET ENTERPRISES, INC.
6340 Tribal Drive
Greensboro, NC 27419

Facet
An Equal Opportunity Employer

POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS

DATA PROCESSING SPECIALISTS

As one of the world's largest and most diversified shipbuilders, Newport News Shipbuilding is a nationally and internationally respected shipbuilding and engineering organization. We employ highly-skilled professionals dedicated to building products of the highest quality.

If you're a data processing specialist eager to join a dynamic and growing company, we have the following opportunities available:

COMPUTER INTEGRATED MANUFACTURING (CIM)

Project Leader
- CAPP
- Computer Integrated Pipe Manufacturing

CAD/CAM Analyst
- CV 4000 for N.C.
- CV 5000 (IBM 4361), CV CDSR 5030

DATA BASE ADMINISTRATION—IDMS

D. B. Analyst
Data Dictionary Administrator

APPLICATIONS PROGRAMMING—IBM 3083, 3081

Cobol Programmer Analyst
- Production/Materials/CIMS
- Financial/Administrative

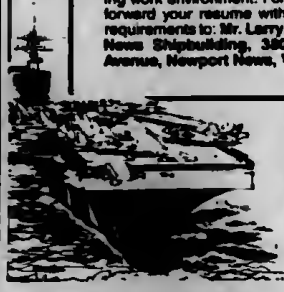
SYSTEMS PROGRAMMING

Communications Analyst—VTAM/NCP
Systems Support Analyst—MVS/SP, MVS/XA

SYSTEMS MANAGEMENT—IBM/HONEYWELL

Problem and Change Coordinator

Working with Newport News Shipbuilding, you will enjoy a competitive salary, an outstanding benefits package and a challenging work environment. For a prompt reply, forward your resume with salary history/requirements to: Mr. Larry Peek, Newport News Shipbuilding, 3500 Washington Avenue, Newport News, Virginia 23607.



TENNECO

Newport News Shipbuilding
A Tenneco Company

An equal opportunity employer with U.S. Citizenship required.

UNIVERSITY OF KENTUCKY
Associate Director of University Computing For Administrative Systems

The University of Kentucky, a major state supported institution with a total enrollment of 45,000 students consisting of a Main Campus, Medical Center, and a 13 college Community College System, seeks to fill the position of Associate Director of University Computing For Administrative Systems.

The Associate Director of University Computing for Administrative Systems, reporting to the Director of University Computing, is jointly responsible for the development and oversight of university-wide administrative and management information system plans, policies, and priorities. Specifically responsible indirectly administrative and management information systems planning, policy, and priority development; administration and management of major university data bases; oversight and review of administrative and management information system hardware and software acquisitions; and various administrative and management information system consultive services to administrative units of all levels within the University.

Minimum requirements are a Masters degree in management information systems and data base administration and management, and a minimum of six years experience in progressively responsible planning, policy making, and administrative and management information system positions or the equivalent combination of education and experience. Experience in higher education, experience in dealing with the problems and opportunities inherent in the administration and management of a complex University, familiarity with data processing and office automation equipment and commercially available administrative software; and the capacity of communication effectively and providing leadership in a comprehensive, decentralized educational environment preferred. Qualified applicants may be considered for academic tenure.

Deadline for receipt of letter of application, including minimum acceptable salary, and resume is December 14, 1984, but may be extended if additional applicants are necessary. Send to: Lee Fowler, Campus Employment Office, East Maxwell Street, University of Kentucky, Lexington, Kentucky 40506-0014.

Equal Opportunity Employer

CURIOUS ABOUT CLASSIFIED?

If you are interested in advertising with **Computerworld** but don't know how to do it, give us a call! We will be glad to send you our current rate card, which explains sizes, costs, deadlines and requirements. Along with that, we can send a demo paper which actually shows examples of ad sizes, typefaces, and prices. All you have to do is ask! **Our toll free number is 800-343-6474, in Massachusetts call (617)879-0700, just ask for the Classified Advertising Department.** Or, you can look for our classified order form located in the classified section of Computerworld. Fill it out, attach your ad with a check, and return it to us. Computerworld Classified Advertising, 375 Cochituate Rd., Box 880, Framingham, MA 01701. We're anxious to help!

DALLAS IS EXPLODING

We are looking for more of the finest, most dedicated computer professionals we can find; those who are prepared to help us meet the challenge of our promising future. As a "state-of-the-art" data processing service firm we are involved in telecommunications, data base technology, conversions, software design and auditing for diversified clients coast to coast. Our Dallas office currently has positions available for computer programming professionals with two or more years experience in any of the following disciplines:

Banking Applications	OS COBOL, IMS DB/DC
Mortgage Banking	OS COBOL, ALC
Commercial Loans	OS ALC, CICS
Customer Information System (CIS)	DEC/VAX, COBOL HP 3000, FORTRAN

CAP GEMINI DASD Corporation offers qualified candidates excellent compensation and benefit packages, including paid overtime. For immediate consideration call or send your resume today.

Ron Flynn
2350 Valley View Lane, Suite 420
Dallas, TX 75234
(214) 247-0777

CAP GEMINI DASD
PEOPLE/PRODUCTS/RESULTS

START THE NEW YEAR WITH A NEW JOB!

Keep that New Year's Resolution! Interview now—start next year. If your experience matches one of the job descriptions below, you may be on your way to a new position. Client companies pay all fees, interviewing and relocation costs. All positions in large scale IBM shops.

Manufacturing - Contact Susan Lankford

Sr. Prog., 2+ yrs. COBOL, CICS	To $30K
Sr. Prog/Anal, CICS, VM/CMS	To $32K
Telecom. Mgr, 5+ yrs. large network	To $35K

Banking, Insurance - Contact Kelly Davidson

DBA's, 5+ yrs. IMS	To $40K
Sr. Sys. Analyst, IMS, CICS	To $35K
Sys. Analysts, 3-5 yrs. CICS, Banking	To $32K
CICS Sys. Prog., OS/MVS	To $32K
Prog/Anal. (several openings), 2+ yrs. CICS	To $30K

Several similar positions available - experienced only please. Call (904) 725-0887, or send resume to:

Advanced Recruiters INC.
P.O. Box 17489
Jacksonville, FL 32245-7489

COMMUNICATIONS SYSTEMS ANALYST

HDR Systems, a leading systems consulting firm, is experiencing rapid growth. This expansion has created the need for a communications professional in our corporate headquarters in Omaha.

The ideal candidate will have the ability to design and develop data communication projects. A bachelor's degree in computer science or related technical degree, 3 years data processing experience with 2 years in the communications field. Strong knowledge in communication drivers and protocols such as SDLC, HDLC, SNA and Ethernet.

HDR Systems offers an excellent compensation and benefits plan, including relocation assistance, and an opportunity to continually advance your career in both responsibility and earning potential. For immediate consideration call TOLL FREE Rob Johnson at 800-288-2701 or write

HDR Systems
8404 Indian Hills Drive
Omaha, NE 68114

An Equal Opportunity Employer M/F

HDR

WE WANT WETWARE

FOR OUR DATA PROCESSING CLIENTS.

CompuSearch, a division of Management Recruiters, serves the nation's top companies and they demand the best DP specialists to fill their job openings. In turn, they offer positions with meaningful challenge, on-going training and defined promotional paths.

Call toll free 1-800-227-3800, Ext. 7017

COMPU SEARCH®
A Division of Management Recruiters International

WE NEED YOU.

We need professionals to work in our MICS, PAS and TSO/MON product lines who are knowledgeable in state-of-the-art IBM technology with experience and expertise in:

- MVS/XA or TSO
- VTAM or SNA
- IMS, CICS, or DBII
- SMP and INFO/SYS
- ISPF

We need *you*, if you also have a solid background in MVS installation management in any of these areas:

- Product Development
- Customer Service
- Systems Modeling
- Capacity Planning
- Computer Education
- Network Management and Performance
- SMF and RMF Data Analysis
- Product Documentation
- Problem/Change Management

Our atmosphere is casual, but intensely productive. Our salary, benefits, and relocation package is one of the best in the industry. Our commitment is to excellence — in software products, user support, education and staff.

If you are interested in a fast-paced, technically challenging, business driven firm, that is among the top 50 U.S. supplier's of software products and services as ranked by the ICP Software Business Review, call or send credentials to:

Marianne Brown

MORINO ASSOCIATES, INC.
8615 Westwood Center Dr.
Vienna, VA 22180-2219
(703) 448-8868

An Equal Opportunity Employer

VM SYSTEMS PROGRAMMERS

35 Hour Week!
Easy Work

If that's what you really want, these jobs aren't for you. But if you're looking for a tough job as part of a small team developing VM/SP systems software products, if you want growth and recognition for your ideas and work—read on.

We need two people: (1) A top VM/SP Systems Programmer with good CP internals knowledge and outstanding coding and debugging skills, experience with other systems is desirable. And (2) A Junior Dynamics Programmer or Trainee with VM/SP experience. Both will be involved in more than one of the following, depending on interest and skills: product planning, development and documentation, system maintenance, utility development, customer and internal user support.

What you can do is more important than what you have done—we want ability and the willingness to work hard, rather than a great resume. If you think you'd fit, please write to:

VM Systems Group Incorporated
2200 South 5th Street
Arlington, VA 22204
"Solving The Hard VM Problems"

PUBLISHING SYSTEMS COORDINATOR

Medium sized newspaper is seeking individual with 2+ years experience with Tandem computers and/or newspaper systems. This challenging position will be responsible for coordinating and evaluating user departments in the use of a new "State of the art" publishing system schedule for early 1985 delivery.

Candidates should possess good communication and problem solving skills and the ability to work independently on large projects. Prior programming experience is a necessity, supervisory experience a plus. Salary to $35K, EOE. Excellent company benefits.

The Modesto Bee is located in California's sunny central valley which offers an abundance of recreational opportunities.

Submit application no later than January 4, 1985 to:

THE MODESTO BEE
Personnel Office
1325 H Street
P.O. Box 3828
Modesto, CA 95352
E.O.E.
Women and Minorities encouraged to apply.

LOCAL-SOUTH -NATIONAL-

SNA Network Engineer	To $45K
Data Communications Tech	To $30K
CICS Analyst/Programmer	To $30K
DB Administrator	to $30K
PL-1 Programmer/Analyst	To $28K
EDP Auditor	To $28K
UNIX "C" PIA's	To $40K

Snelling and Snelling
1280 Starks Building
Louisville, KY 40202
(502) 585-5841

TOTAL INVOLVEMENT: DRC

For more than 29 years, talented technical professionals have given Dynamics Research Corporation unmatched visibility within the Department of Defense in a field that demands nothing short of total involvement—weapon systems analysis, evaluation and engineering.

Right now, our continuing success has created challenging opportunities in Data Communications, Software Engineering and Information Systems Analysis and Development.

INFORMATION SYSTEMS

The challenge is information analysis and development to support DoD Systems Engineering and logistics support efforts. We are looking for degreed professionals with 2-20 years' experience in any of the following areas:

- Honeywell DPS-8, GCOS, GMAP, DMIV/TP, IDS II
- VAX 11/780, VMS, DBMS, ORACLE, DATATRIEVE
- Data Communications—DoD Protocols, Public Data Networks, LANS.

Our current openings include Programmer/Analysts, Systems Software Specialists and Systems Analysts. Some Systems Analyst positions are involved at the functional requirements level and require a strong background in user interface/requirements definition rather than specific vendor association.

SOFTWARE ENGINEERING & MANAGEMENT

Professionals in this group work with a wide range of state-of-the-art tools, with a strong focus on undersea and missile systems, avionics and C^3.

Tool involvement includes:

- PSL/PSA
- SREM
- PASCAL
- CMS-2
- ADA
- DATATRIEVE & PDL

If you're a degreed **Software Engineer** with 2-10 years' defense related experience, you can get involved with challenges ranging from project management, quality assurance and requirements analysis/specification to independent verification and validation, software metrics, nuclear safety analysis and tool development.

Get involved.

If you're a talented professional who demands nothing less than total involvement from your career, send your resume, specifying area of interest, to Matt McKechnie, Dynamics Research Corporation, 80 Concord Street, Wilmington, MA 01887.

An equal opportunity employer
U.S. Citizenship required.

DRC DYNAMICS RESEARCH CORPORATION
WILMINGTON, MASSACHUSETTS

MIS AND DATABASE DEVELOPMENT PROFESSIONALS

NEXUS Associates has been retained by a nationally recognized "Fortune 100" financial services industry leader to locate and recommend 40-50 highly qualified MIS and database software professionals for career opportunities available over the next few weeks.

THE PROJECT WE ARE TALKING ABOUT-
"TOMORROW'S IDEAS TODAY
The hardware environment is IBM 3083 and 4341 under MVS. The on-line interactive database projects are being developed primarily on IDMS. This project involves creating an entirely new network architecture and building prototype systems that will become industry standards.

THE KIND OF PEOPLE WE WANT
We want people who love challenge, who thrive on change, are creative and self-starting. For most positions a Bachelors degree or equivalent experience in data processing is preferred. Candidates should possess top notch organizational, oral and written communication skills.

REWARDING EXCELLENCE
Talent and effort are rewarded both financially and with increased responsibility. *The compensation package is extremely competitive* - and includes company-paid benefits, savings and stock ownership plans, credit union, educational assistance, relocation, and free parking.

THE EXPERIENCE WE ARE LOOKING FOR
We are especially interested in professionals with 2-4 years of IDMS experience including hands-on knowledge of ADS/O, CULPRIT, and other Cullinet software enhancement tools. A strong background in COBOL is required for most positions and a solid working knowledge of TSO/SPF and IBM MVS JCL is preferred.

POSITIONS: Programmer Analysts/Applications Development, Technical Analysts/Development Support, Senior MIS Analysts-/Data Processing Planning, Senior Technical Analysts/Configuration Management, Senior Database Administrators, Project Managers, Senior Systems Analysts/Applications Development, Senior Operations Managers.

AREAS: Database Design & Development, Requirements Analysis, Configuration Analysis/Management, Data Communications Analysts, Network Architecture, Performance Monitoring & Evaluation, Quality Assurance & Standards, Applications Systems Development, Documentation, Training, Operations.

For interested and qualified candidates, initial interviews will be arranged in your local area. For immediate consideration, please call or forward your resume in confidence to George A. Ridenour, President, NEXUS Associates, 5861 Leesburg Pike, Suite 101, Falls Church, Virginia 22041. Telephone (703) 998-6363.

EXPERIENCED SYSTEMS PROGRAMMERS, ANALYSTS AND PROGRAMMER ANALYSTS FOR SUNBELT LOCATIONS

Job dissatisfaction, complacency, and frustration are the biggest obstacles to everyone to achieve one's career goals. Everyday new career opportunities pass us by because we are unaware of their existence. Let us keep you abreast of what your true value is in the market place. Absolutely no obligations, please call or write Keith Fischle, CPC, Data Processing Specialist.

Dunhill
OF CHARLOTTE, INC.
6601 Carmel Road, Suite 107
Charlotte, North Carolina 28226
800-438-2012
(NC Call)
(704) 542-8312

FREE RESUME SERVICE

Even though we are a recruiting firm, we do offer a free resume service. Write or call for a resume preparation form. Complete the form and mail to us and we will return a completed resume to you. This is a confidential service with no obligation.

Call 919-378-1261
Adkins and Associates, Limited
P.O. Box 19062
Greensboro, NC 27419

Software Technical Support

Cognos Corporation is one of the world's largest suppliers of packaged software to the commercial minicomputer market. High quality products and an excellent sales and technical team have been the key to our 50%-plus growth over each of the past five years.

We are seeking Product Consultants to be essential members of our sales and technical team to support PowerHouse, our fourth generation application development language. All positions require a minimum of three years' systems development experience on the HP-3000 or DEC VAX or Data General MV series computers. Some travel is required.

Positions are available in the following areas:

Atlanta	Los Angeles
Cincinnati	Seattle
Philadelphia	Chicago
San Francisco	New York
Boston	Washington, DC
Dallas	W. Palm Beach

Cognos offers a highly competitive salary, bonus plan, excellent benefits and a challenging environment. Send resume stating location preference to: **Human Resources Department, Cognos Corporation, 1681 Oakland Blvd., Suite 100, Walnut Creek, CA 94596.** We are an equal opportunity employer.

COGNOS

In a bind?

Do you need real professionals? Advertise in **Computerworld** to find exactly who you're looking for. Because...More computer people read **Computerworld** than any other newspaper in the United States–more than half a million computer people every week. And, among our 529,650 readers at user organizations, about half claim to look at recruitment ads at least every other week (only a small percentage say they never look at recruitment ads). No wonder **Computerworld** carries more recruitment ads for computer people than any other publication.

To place your ad or to get a rate

Call or write:

Classified Advertising
Computerworld
Box 880
Framingham, MA 01701
(617) 879-0700
(800) 343-6474

AVERY INTERNATIONAL OFFERS YOU A WORLD OF OPPORTUNITY!

Avery International, a Fortune 500 manufacturer of self-adhesive products, pressure sensitive tapes and base materials, labeling systems and office products, is seeking outstanding professionals to join our Corporate Center.

Excellent opportunities currently exist in the following careers:

MANAGER, DISTRIBUTED COMPUTING

The successful candidate must have strong management and interpersonal communication skills as well as a working knowledge of Personal Computers. Familiarity with MIS issues in a manufacturing environment and a consulting background a definite plus. This individual should have 7-10 years experience in the MIS field with a Bachelor's degree in Business or Computer Science. An MBA is highly preferred.

PROGRAMMER ANALYST

Requires a minimum of three years of COBOL programming experience on an IBM Mainframe, with strong background in OS/JCL. Good analytical skills required. Experience with Genesys Payroll System and/or Personal Computers a definite plus.

SYSTEM MANAGER/PROGRAMMER

(Avery International Research Center)
Must have experience in RSX-11M and VAX/VMS operative systems. Proven abilities in business software required; knowledge of scientific software preferred. Should have some hardware/electronics background. This individual will manage and maintain the DEC computer system.

Avery is located in Pasadena, California and offers an attractive work environment and competitive salary and benefits package. Interested applicants should send resume with salary history to: Avery International, Human Resources Department, 150 N. Orange Grove Blvd., Pasadena, CA 91103. An Equal Opportunity/Affirmative Action Employer.

Avery International

EMPLOYMENT SERVICE FOR PROGRAMMERS AND ANALYSTS

National Openings With Client Companies
and Through Affiliated Agencies

Scientific and commercial applications • Software development and systems programming • Telecommunications • Control systems • Computer engineering • Computer marketing and support

Call or send resume or rough notes of objectives, salary, location restrictions, education and experience (including computers, models, operating systems and languages) to either one of our locations. Our client companies pay all of our fees. We guide, you decide.

RSVP SERVICES, Dept. C
Suite 700, One Cherry Hill Mall
Cherry Hill, New Jersey 08002
(609) 667-4488

RSVP SERVICES, Dept. C
Suite 211, Dublin Hall
1777 Welsh Rd., Blue Bell, PA 19422
(215) 629-0595

From outside New Jersey, call toll-free 800-222-0153

RSVP SERVICES
Employment Agents for Computer Professionals

JOIN THE LEADING EDGE

OUR CLIENTS, the leading national and international corporations, offer outstanding career opportunities, latest state of the art technology, nationally competitive salaries and the finest fringe benefits available in highly desirable Southeastern locations. Salaries from $22-42 K.

ANALYST • PROGRAMMERS
with a minimum of 2 years experience in:
TECHNICAL SUPPORT
PROCESS CONTROL
SCIENTIFIC PROGRAMMING
COMMERCIAL APPLICATIONS

OR LARGE IBM MAINFRAME OR IBM 5100 DEC PDP OR VAX HARDWARE IN VM, MVS, IMS, IDMS, CICS, SNA/BLDC, GPPX, BPCX, RSX-11M+, DECNET

WE ARE PROFESSIONAL RECRUITERS

Our client companies pay our fees and your interview and relocation expenses. Your inquiries and our referrals are CONFIDENTIAL. You may call TOLL FREE 1-800-[illegible] (in N.C. 919-[illegible]) or mail us a complete chronological resume or work history (functional options are fine)—your current salary, career salary and geographic objectives.

WE PRACTICE AFFIRMATIVE ACTION

STO FOX personnel consultants
P.O. BOX [illegible] • GREENSBORO, N.C. [illegible]

SAUDI ARABIA

SYSOREX INTERNATIONAL, a California corporation and a rapidly growing systems management company now developing innovative multi-technology systems in Saudi Arabia, has the following challenging positions:

Systems Programmer

Min. 5 yrs. solid systems programming experience with IBM MVS/SP, TSO, CICS; with working knowledge of VS/1, NCP/VTAM, RCAF or ACF2 or Top-Secret and some database experience. Degree required.

Programmer/Analyst

5 yrs. exp. in developing and maintaining interactive systems using large-scale IBM OS/MVS, CICS, COBOL, ADABAS and TSO.

Payroll/personnel applications experience required and experience in structured analysis/design work as part of a small team. Must be able/willing to program as required. Degree required.

Micrographic Supervisor

4-6 yrs. recent experience with latest micrographic optical recording and storage hardware and techniques. Must be familiar with conventional source documentation microfilming and computer assisted retrieval. Will interface with user and provide user training as required. Some supervisory experience a plus. Degree required.

We offer an excellent benefit package including: medical, life, accidental death, disability and profit sharing plans. You will additionally receive 25 working days vacation, 15 holidays, free furnished housing, annual return home travel, paid relocation expenses, plus eligibility for present Federal Income Tax exclusions.

Please send resume, INDICATING POSITION TITLE FOR WHICH YOU ARE APPLYING, with present salary to Personnel MODA Project # CW-11/26, SYSOREX INTERNATIONAL, INC., 10590 N. Tantau Ave., Cupertino, CA 95014. U.S. CITIZENSHIP REQUIRED. INDIVIDUALS ONLY APPLY.

SYSOREX

Sysorex International Inc.

ATLANTA

HEARTBEAT OF THE SOUTH!

CAP GEMINI DASD, an internationally established leader in the Data Processing Consulting field, has multiple openings in the Atlanta Branch Office for qualified candidates with experience in the following areas: **Programmers, Programmer/Analysts, Systems Analysts, Project Leaders, and D.B.A.'s.**

Qualified applicants will have experience in two or more of the following skills:

MVS or DOS/VSE	IMS DB/DC	TANDEM
COBOL	ADABAS	DATACOM DB
RPG	IDMS DB/DC	IDEAL
PL/I	ADSO	SCOBOL
CICS	ASSEMBLER	

As a career-oriented company, we offer a comprehensive benefits program including paid overtime. If you have an interest in improving your career and lifestyle in the South's perfect climate, please call or submit your resume.

2960 Brandywine Road
Atlanta, GA 30341
(404) 455-9301

CAP GEMINI DASD

PEOPLE/PRODUCTS/RESULTS

WITH PLENTY OF SOUTHERN EXPOSURE.

We're The Federal Reserve Bank of Atlanta, provider of wholesale banking services and support for advanced economic research and analysis. Our home city of Atlanta is one of the nation's most beautiful cities, which boasts a wonderful combination of a modern and picturesque environment. We'll be in Chicago for three days to meet you and discuss the following exciting career opportunities for computer professionals in Atlanta.

• IMS DB/DC APPLICATIONS PROGRAMMERS/SENIOR PROGRAMMERS

These positions require 1-3 years experience in COBOL programming in an MVS environment using IMS DB/DC, including MFS and BTS (on-line, i.e., DC programming required). In addition, exposure to JCL, PANVALET, TSO/ISPF and Dialogue Manager would be an asset, and knowledge of Assembler and IBM PC programming is a plus.

• IMS DB/DC APPLICATIONS PROGRAMMER/ANALYSTS

These positions require 3-5 years experience in an MVS environment conducting automated systems studies for user departments, designing systems, and providing specs for development. Strong experience in IMS DB/DC programming (COBOL) is necessary (on-line, i.e., DC programming required). In addition, qualified candidates will have had exposure to MFS, BTS, JCL, PANVALET, and TSO/ISPF. Knowledge of Assembler and IBM PC programming is a plus.

If you're a computer professional who qualifies for one of these unique and exciting career opportunities, and are interested in working in a sophisticated city with a real down-home feeling, THE FEDEAL RESERVE BANK OF ATLANTA is prepared to offer the individuals we select an excellent starting salary commensurate with experience, a superb benefits package and most of all, the outlook of a brilliant future with a great institution in a warm and healthy environment.

Qualified applicants, please call ROBERT BLAIN, DP Recruiter, COLLECT, at 404-521-8774 to set up an interview appointment. We will provide transportation to CHICAGO for qualified applicants.

THE FEDERAL RESERVE BANK OF ATLANTA
P.O. BOX 1731
ATLANTA, GA 30301-1731

AN EQUAL OPPORTUNITY EMPLOYER M/F/H/V

Data Processing

Programmer/Analyst

Bendix Fluid Power Division has an excellent opportunity for an experienced Programmer/Analyst in it's MIS Department. The successful candidate will play a key role in a highly visible project, the installation of an On-line Time and Attendance/Shop Floor Control System, and will have numerous other responsibilities.

Bendix offers a competitive starting salary, an excellent package of benefits and a great career opportunity for the right MIS Professional. If you have at least 5 years of programming experience (3 years in manufacturing) and exposure to:

- IBM 3081, 4100 • MVS, JES2
- ISPF/ • TSO, SPF • COBOL

Send resume to Personnel Manager, Allied Bendix Aerospace, Fluid Power Division, 211 Seward Ave., P.O. Box 457, Utica, NY 13503

ALLIED Bendix Aerospace

An Equal Opportunity Employer m/f/h/v/d

ENGINEERING - Assistant to Dean Engineering Computing. Position carries responsibility for the operational status of the computing system, assist faculty with the development of computer programs for educational and research application, provides faculty with information related to computer software and hardware availability and advises on such acquisitions in liaison with computer services. Additional duties include scheduling usage of the computing system, coordinating engineering college computing needs with the university computer services department. Minimum qualifications: PhD degree in Engineering or related area, strong background in minimum computer operations and engineering applications programming. Preferred qualifications: operating systems experience, real-time computing experience, college level teaching experience. Send resume and references information, to: Anthony S. Perrier, Dean, College of Engineering, CLEVELAND STATE UNIVERSITY, 1983 E. 24th Street, Cleveland, Ohio 44115. An equal opportunity employer m/f/h.

NEW ENGLAND

BOSTON

IMS DBA

One of the areas best known firms seeks a DB analyst or admin. to convert this MVS environ. to IMS-DBDC. Shop is multi IBM CPU's. Oppty. to lead the firm's efforts in DBMS tech & move into mgmt. $45,000.

FOCUS SYS. ANALYST

One of the area's premier banks has an exciting oppty. for you to develop new sys. for user depts. IBM OS/MVS VM/CMS, FOCUS, LOTUS, PC environ. Manage people & projs. in a dynamic, progressive shop. $32,000

PROVIDENCE

PROJECT MGR.

Div. of Fortune 500 co. seeks Sr. Prog./Analyst to/lge. IBM sys. bkgrd. Sales appl. knowl. desired. Supv. small staff. $34,000

HARTFORD

SYS. ANALYST/ PROGS.

Div. of CT based corp. expanding devel. staff. Excellent oppty. to work in state-of-the-art on-line appl. Min. 1 yr. COBOL bus. exp. qualifies for salaries in $22-$33,000 range

ROBERT HALF

EDP PERSONNEL SPECIALISTS

Contact the Manager of any office listed below.

100 Summer St., Boston, MA 02110
(617) 423-1200
111 Pearl St., Hartford, CT 06103
(203) 278-7170
900 Turks Head Bldg., Providence, RI 02903
(401) 274-5700

Client Companies Assume All Fees.

POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS

Data Processing

YOUR BEST CAREER INVESTMENT IS FLORIDA POWER.

Because Florida Power Corporation wants to invest in you. We see each Florida Power person as an extension of our success in bringing energy services to three million Floridians. So we help you achieve your potential through continued education, management training, and challenging job opportunities.

SR. TELEPROCESSING PROGRAMMER ANALYST

Bachelor's Degree and 6 years experience or equivalent. Extensive knowledge of online computer concepts, BAL, VTAM, NCP or MAF COMTEN also needed. You install, implement, and maintain teleprocessing information systems and utility support systems, and perform problem determination for both hardware and software problems.

DATA PROCESSING OPPORTUNITIES

Bachelor's Degree and 2-7 years experience in programming. Candidates must be knowledgeable in structural programming techniques, ANS COBOL, IBM OS/VS JCL, and CICS. TSO and VSAM experience is highly desirable. You'll participate in the analysis, design, development, implementation and maintenance of computer systems and programs.

Florida Power Corporation offers a competitive salary and a superlative benefits package. Not to mention the Gulf Coast good life. Send your resume, in confidence, to:

D. Givens
Professional Staffing
Section 84029-CW
FLORIDA POWER CORPORATION
3201 34th Street South
St. Petersburg, Florida 33711
A CAREER WORTH LIVING

Florida Power CORPORATION

U.S. Citizenship Required.

Operation IMS
The West Coast Project

Phase I: Locate Programmer/Analysts with extensive experience in either: a) IMS DB/DC, COBOL or PL/1, b) ACP/TPF teleprocessing monitor technology, c) Info Center/4th generation software such as NOMAD2 or FOCUS.

Phase II: Relocate to project sites in either San Francisco, Santa Clara, Los Angeles, Portland or Seattle.

Phase III: Promote on-going technical training to prepare consultants for new generations of systems development in banking, insurance, manufacturing, aerospace, corporate finance and telecommunications.

KNAUER's Operation IMS means salaries and management opportunities that set new standards for DP consulting worldwide. As part of our full-time permanent staff of senior professionals you'll work on a variety of projects. Our benefits include the 401k plan and extensive insurance coverage.

Call Marcie Podgur in San Francisco, (415) 434-4200 collect, to arrange an appointment. If you can't attend, send us your resume in confidence to explore our many consulting opportunities.

KNAUER CONSULTING

44 Montgomery, Suite 1300, San Francisco, CA 94104

Join our systems management team in SAUDI ARABIA as a:

SOFTWARE SECURITY SPECIALIST/RACF

6-10 yrs. experience in the design, acquisition and implementation of state-of-the-art security techniques to protect all electronically stored data. BS/BA degree required plus min. 6 yrs. exp. in large-scale systems, with at least 1 yr. RACF exp. required. Experience in designing and implementing facilities security systems including access methods such as monitoring systems a plus.

Company offers excellent benefit insurance package at no cost to employee or eligible dependents. You will additionally receive 25 working days vacation, 15 paid holidays, free furnished housing, annual return home travel, paid relocation expenses, plus eligibility for present FEDERAL INCOME TAX exclusions. U.S. CITIZENSHIP REQUIRED.

Please send resume to:

CW-B4100
Computerworld
Box 880
Framingham, MA 01701

HIRING?

More computer people read Computerworld than any other newspaper in the United States - more than half a million computer people every week.

And, among our 529,650 readers at user organizations, about half claim to look at recruitment ads at least every other week (only a small percentage say they never look at recruitment ads).

No wonder Computerworld carries more recruitment ads for computer people than any other publication.

To place your ad or to get a rate card with complete details on Computerworld Classifieds, call or write:

Classified Advertising
COMPUTERWORLD
Box 880
Framingham, MA 01701
1-800-343-6474
817-879-0700

PUT FLORIDA'S FUN IN YOUR FUTURE!

Trade your snow skis for water skis and [illegible] status with Florida's most prestigious [illegible] looking for EDP Professionals with [illegible] following categories

1. UNIX, C
2. MODEL-204
3. RAMIS II, VM (SAS a plus)
4. PL-1, IMS, MVS, TSO/SPF
5. PROGRAMMER/ANALYST on Univac [illegible]
6. COBOL, CICS, MVS, IMS DB/DC, TSO/SPF
7. COBOL, IDMS, MVS, TSO/SPF
8. ADABASE, NATURAL

We offer paid relocation, excellent benefits [illegible] commensurate to experience.

Send resume to:
Mr. Fred J. Pawlaczyk
Corporate Technical Director

SOFTWARE SERVICES OF FLORIDA INC.
A subsidiary of ORBITRON INTERNATIONAL INC.

PARAGON CROSSING, SUITE 124 11300 4TH ST N. ST PETERSBURG, FL 33702
(813) 577-1475

ROMAC.

FLORIDA
MEET THE CHALLENGE

Florida's tremendous growth has created unique opportunities in state of the art environments for motivated, skilled data processing professionals.

PROGRAMMERS, ANALYSTS, SOFTWARE ENGINEERS, SYSTEMS PROGRAMMERS

UNLOCK YOUR POTENTIAL

Romac & Associates of Florida, Inc.

One Tampa City Center, Suite 2000, Tampa, FL 33602, 813-[illegible]
600 W. Cypress Creek Road, Suite 600, Ft. Lauderdale, FL 33309, 305-[illegible]
201 So. Orange Avenue, Barnett Plaza, Suite 500, Orlando, FL 32801, 305-[illegible]

COORDINATOR FOR ADMINISTRATIVE COMPUTER SERVICES
UNION COLLEGE OF NEW YORK

The Office of Computer Services is seeking an Administrative Services Coordinator, one of three senior positions in the department. The successful candidate will have 3-5 years of data processing project management experience, a proven ability to work with individuals and groups, and very good communication skills.

The Coordinator is responsible for all administrative software and services, and oversees the activities of programming project teams involved in software development and maintenance.

Union College is a highly selective independent residential college of about 2,000 undergraduates, offering liberal arts, engineering and computer science circuits along with a small graduate program.

The College is located in New York State's Capital District Area near the Adirondacks, and the region offers a wide variety of educational, cultural and recreational opportunities.

The position is available January 1, 1985. Special consideration will be given to candidates with any of the following: an advanced degree in an appropriate discipline, expertise with the HP3000 computer system, or management experience in an academic environment. The college encourages applications from women and minority group members. Salary $27,500 to $35,000 DOE; fringe benefits generous. Write, including full resume plus contact information for three references, no later than December 21, 1984 to:

George R. Richards, Director of Personnel
Union College, Schenectady, N.Y. 12308

POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS

COMPUTER PROFESSIONALS

Model 204

INFORMATION SYSTEMS & NETWORKS CORPORATION is one of the fastest growing companies on the east coast, and a leader in the areas of Database Management and Development, Systems Analysis, and other related fields including Telecommunications, LAN, and Systems Integration. ISN is primarily a Federal Government Contractor headquartered in Chevy Chase, Maryland.

ISN is seeking experienced Model 204-users language and file manager programmers to expand our staff of Model 204 professionals and meet our current contract commitments. A background in database management systems applicable to Model 204 is required. Also, a degree in a related discipline is required.

INVESTIGATE THE OPPORTUNITIES WITH ISN

ISN offers outstanding company - paid benefits, including 401K pension plan, excellent compensation and the opportunity to work with professionals. For IMMEDIATE response, send resume to: LES KLINGENSMITH

ISN

INFORMATION SYSTEMS & NETWORKS CORPORATION
5454 Wisconsin Avenue, Suite 1450
Chevy Chase, Maryland 20815

Equal Opportunity Employer M/F/H

St. Lawrence University is seeking a person to fill the position of Programmer/Analyst. SLU is located in scenic northern New York State, 20 miles from the Canadian border.

The ideal candidate will have a minimum of 2 years Programmer/Analyst experience with a working knowledge of CICS command level coding. The operating environment consists of an IBM 4341 utilizing VM, and DOS/VSE.

Send resume to:

St. Lawrence University
Office of Personnel Services
Park Street
Canton, NY 13617

an affirmative action equal opportunity employer M/F/H/V

EDP Professionals

SYSTEMS ANALYST: Int'l assignment, family status. Requires degree & 3+ Yrs MVS systems programming. Familiar with ACF2 MVS/XA HSM IMS DB/DC-TMS

SYSTEMS SOFTWARE ENGR: Int'l assignment, family status (Europe). 10+ Yrs IBM. OS/MVS, VM, CICS, DPPX & DPCX, SCP

SYSTEMS ANALYST: Sunbelt location. Degree & 5+ Yrs IMS DB/DC OS, TSO, JCL, Mark IV/SAS.

Excl salaries. All replies confidential. Many other positions available (overseas & domestic). Fees paid by client companies. Contact: V. Stephens, 713/643-0901.

CHANNEL PERSONNEL SERVICES, INC.
7007 Gulf Freeway, Suite 214, Houston, TX. 77087

STATE OF THE ART
LIVING & WORKING
ENVIRONMENT
OF EXCELLENCE
(AND NO STATE INCOME TAX).

Recent promotions created openings for:

3 ANALYST/PROGRAMMERS
AND
3 PROGRAMMERS

Experienced in ONE of the following:

COBOL
BASIC
CICS

Join a profitable expanding FORTUNE 50 retailer offering OUTSTANDING CAREER GROWTH, PAID RELOCATION and 24+ BENEFITS. Respond in confidence WITH salary history/requirement.

C.A. WEBLER
SERVICE MERCHANDISE CO.
P.O. Box 24600 (CW)
NASHVILLE, TN 37202

EOE M/F/H/V

CONTRACTORS WANTED

If you have any of the following skills:

- Timeshare and Tel
- HP 3000
- HP 1000
- DEC VAX
- Assembler and Natural
- PL/1
- IBM Systems 3

We want to talk to you.
Excellent compensation.
Outstanding benefits.

Please call or send resume to:

CBA COMPUTER, INC.
ALLISN SERVICES DIVISION
310 E. National Rd.
Vandalia, OH 45377

Call toll-free 1-800-543-7666
In Ohio (513) 890-1300

North Adams State College invites applications for anticipated tenure track faculty position beginning September 1985 to teach computer science courses at all levels. Presently we offer upper division concentrations in Software Systems, Information Systems and Scientific Systems, along with an expanding core curriculum. An M.S. in Computer Science is required with a Ph.D. preferred along with some prior teaching experience and a commitment to undergraduate computer science education. North Adams State College is a state supported liberal arts college with 2100 students located in the beautiful Berkshire Mountains. The position will continue to be open until filled. Resumes with cover letter should be sent to the Personnel Office, North Adams State College, North Adams, MA 01247. An EEO/AA employer.

SYSTEM ANALYST

Responsibilities for this position include the development and maintenance of computer software using both micro and mainframe technologies. It involves problem definition, program design, coding and testing of new software modules and analyzing and modifying previously written programs. Experience with D-Base II Software package developing business systems, using PL/1 required and a Bachelor's Degree in Computer Science. 40 Hours/week, $10.35/hour. Apply at the Texas Employment Commission, Richardson-Plano, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778, J.O #3060876. Ad Paid by An Equal Employment Opportunity Employer.

FEDERAL EXPRESS

Federal Express has opportunities for you to work with our absolutely, positively, incredible technology. Rapid growth of our Electronic Products Division has created the need for the following professionals:

TECHNICAL ADVISOR PRODUCT SPECIFICATION

You will be responsible for conceiving, defining, and developing technical specifications and operational procedures for new electronic communication products and services, assessing state-of-the-art technologies and coordinating new product specifications with technology specialists and external hardware/software vendors. A Bachelor's degree in Electrical or Electronic Engineering, Math, Physics or Computer Science and seven years professional experience in technical development of electronic information products and services is required. MBA, project management and international experience is preferred.

SR. ENGINEER - SOFTWARE

You will plan, design, code, test and implement software and firmware for use in electronic mail applications. A Bachelor's degree/equivalent in Electrical Engineering, Computer Science, Math or Physics is required along with five years systems programming experience with minicomputers or microprocessors. A Master's degree is preferred. You must be proficient in real-time assembly language programming as well as high level (BASIC, PL-1, FORTRAN, PASCAL) language programming. Strong communication skills are essential.

This is your opportunity to work with a company on the leading edge of high technology. Federal Express offers a highly competitive benefits package. Please rush a letter indicating your experience and salary history. (Include your resume if you have one.)

TO EXPEDITE CONSIDERATION, CLEARLY INDICATE THE POSITION OF INTEREST TO YOU ON YOUR REPLY ENVELOPE.

FEDERAL EXPRESS CORPORATION
Electronic Products Division
P.O. Box 727, Dept. 3514-431
Memphis, TN 38194

Equal Opportunity Employer M/F

GROWTH OPPORTUNITIES IN SYSTEMS DEVELOPMENT

SENIOR PROGRAMMER ANALYSTS
PROGRAMMER ANALYSTS

We are an established Northwest suburban leasing company. Our growing MIS department needs Senior Programmer Analysts with three to five years MIS experience and Programmer Analysts with two to three years MIS experience including IBM mainframe or System 34. To qualified applicants, we offer a competitive salary, excellent benefits program and challenging career opportunities. Send your resume and salary history to:

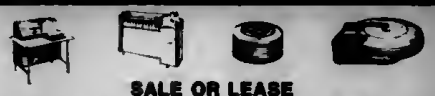
EVANS PRODUCTS COMPANY

Relicar Division
2550 Golf Road
Rolling Meadows, IL 60008

equal opportunity employer m/f/h

BUY - SELL - SWAP

IBM UNIT RECORD EQUIPMENT



SALE OR LEASE

IBM UNIT RECORD MACHINES
026—029—082—083—084
085—087—088—129—514
519—548—557

NEW & USED
DISK PACKS—DATA MODULES
2316—3330(1)—3330(11)—3340(70)
MAG. TAPE-DISKETTES
Every Item Guaranteed

Highest Prices Paid for Used Packs & Modules

THOMAS COMPUTER CORPORATION

FRONTIER Your Full Service Computer Dealer

SYSTEM 34/36/38

Computer Data Supplies

Call Bill, [illegible]

Call Bill, [illegible]

[illegible] TEXAS TOLL FREE [illegible]

BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP

1-800-IBM-USED

The only number you need to call for your IBM computer requirements.

Not a virtual machine — a real machine

3083 E 16

Available Immediately

w/wo M.G. Set

SERIAL #21770

Any Term Lease

3803 - 02

Tape Controller

3420 - 06

Tape Drive

(818) 986-2411

EL CAMINO RESOURCES LTD.

4827 N. Sepulveda Blvd.
Sherman Oaks, CA 91403

The nationwide market - a call away!

DEC/DG

SYSTEMS/PARTS/PERIPHERALS

NEW/USED/SURPLUS • DISCOUNT PRICES

Since 1977! Buy, Sell, Trade and Broker.

PHIL	BRYAN	JENNIFER
DG	11-VAX	8-LSI

CALL TODAY - (305) 392-2005

TELEX 568-670

thomas business systems, inc.
4301 Oak Circle - Unit 13 Boca Raton, Florida 33431

SALE LEASE PURCHASE

DATA GENERAL

Desk Top Models 10, 30 & 20
MV/4000, MV/8000 II, MV/10000
DG/ONE Portable
MV/4000 2Mb Memory
S/280, C/150 Systems
Nova 41X, 3/12, 1200, 1220
8837 Expansion Chassis
Micronova, 6/8b, I/O
Eclipse Memories
MV/4000 1 & 2 MB Memory
ALM-16, ULM-5, SLM-2, DCL200
AMI-8, ATI-16, IAC-8, IAC-16

D210/D211/D410/D460 CRTs
D100/D200/D400/D600 CRTs
TP2, LP2, TP1 Printers
Letter Quality Printers
6160 73Mb Disk System
6161 147Mb Disk System
6239 354Mb Disk System
6286 12.5/1.2 Mb Disk System
6239 354MB Disk System
6321/6866/6125 Tape Systems
4204/4205 600LPM Band Printer
4864 340 CPS Printer

AMES SCIENCES, INC.
301/228-8100

MARION

BUY • SELL • MAINTAIN

IBM SYSTEM/34/36

- PROMPT DELIVERY
- ALL SYSTEMS 34 ARE FULLY RECONDITIONED
- ALL SYSTEMS 34/36 CONFIGURED TO YOUR NEEDS
- PERIPHERALS — NEW AND USED
- UPGRADES AND FEATURES DELIVERED AND INSTALLED
- LONG TERM LEASES AT COMPETITIVE PRICES
- SHORT TERM RENTALS
- TRADE-INS ACCEPTED
- GUARANTEED WMC or IBM MAINTENANCE

A PHONE CALL CAN SOLVE ALL YOUR EQUIPMENT PROBLEMS

TALK TO US . . . NEW JERSEY (201) 343-4554
CONNECTICUT (203) 758-2400
PITTSBURGH (412) 884-6612

WILLIAM MARION CO. INC

DSI

WE BUY SELL & LEASE!

BURROUGHS

Discover the DSI alternative.

800-641-5215

All equipment available immediately and guaranteed for Burroughs Maintenance

DSI Serving the Burroughs Community Worldwide
1440 So. Lipan, Denver, CO 80223 (303) 777-8211 Telex 756-192

BUY • SELL • LEASE

SERIES-1

34 • 36 • 38 • 23

4300 3705 3706 3725

Upgrades
Tubes • Printers • Tapes • Disks

AMCOM CORPORATION
5300 W 73RD ST • MINNEAPOLIS, MN 55435 (612) 835-4737

CALL TOLL FREE
800-328-7723

STC

TAPE/DISK

BUY SELL LEASE

(408) 241-3677

4341

Available Now
For Lease or Sale
For Information Call
Regional Computer Sales Corporation
(313) 656-1900

IBM

3270

We Buy & Sell

DEC

Systems
Components

Digital Computer Resale

call:713 445-0082

600 Kenrich Ste C22
Houston, Tx 77060

FOR SALE

3803-2

With or Without Features
Sitting & Refurbed
Call Jon Kendall
Toll Free
800-328-6729

When you lease equipment, make sure it comes with a good name behind it.

With the rapidly changing and improving technology of your industry, it's not always easy to keep your company's system up to date. And it's important to make sure you get the best advice, the best service, and the best financing available.

- At Greyhound Capital Corporation, we've been leasing, servicing, refurbishing, maintaining and providing financing for computer and other equipment for over 20 years. And we have the resources and the knowledge to help you customize your equipment-leasing requirements. We can also assist you with the financing.

Whether you want to lease or purchase your equipment, look for the name with the kind of strength you need behind it: Greyhound.

Regional Offices

Mike Flannery	Eastern Regional Headquarters	(617) 272-8110
Dave Hyland	Western Regional Headquarters	(415) 283-8980
John O'Shea	Central Regional Headquarters	(312) 789-9100
Ron Geil	Southern Regional Headquarters	(512) 451-0121

Sales Offices in:

Atlanta, Austin, Boston, Chicago, Dallas, Houston, Los Angeles, New York, Philadelphia, Phoenix, Pittsburgh, San Francisco.

Canada Group

Gordon Clarke	Canadian Headquarters	(416) 366-1575

Greyhound Capital Overseas Corporation

Don Haworth	International Headquarters	(214) 233-1818

Offices in London, Paris, Geneva, Munich

GREYHOUND CAPITAL CORPORATION

A subsidiary of The Greyhound Corporation

BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP

Why Worry?

Let DANA Do Your Sweating!

For All Your IBM® Buy/Sell/Leasing Needs

DPD			CSD		
CPU	DISK	TAPE	CPU	PRINTER	TERMINAL
4341	3380	3420	S/34	3211	5251
4331	3375	3803	S/36	3262	5291
3081	3370		S/38	5224	
3083	3350			5225	

Authorized dealer for CBT® and Decision Data® Products
Printers and CRT's plug compatible to S/34, S/36, S/38

DANA MARKETING, INC.

800 433-4148

In California call 213 212-3111

Connecticut office 203 359-8040

SERIES 1

NEW, USED, FEATURES, & CDC PERIPHERALS.
HARD TO FIND NEW PRODUCTS IN STOCK.

34, 36, 38.

S/36's UNDER IBM LIST.
72 HOUR UPGRADES, S/38 FEATURES.

4331/4341.

TAPE, DISK, PRINTERS,
FLEXIBLE LEASE ALTERNATIVES.

5110, 5120, S/23.

DISPLAY WRITERS IN STOCK NOW.

800/328-3884

IN MINNESOTA, CALL 612/339-3042

We do an exceptional job— our clients do repeat business.

X-ceptional!

XERXES COMPUTER SALES
1614 Harmon Place
Minneapolis, MN 55403

Buy - Sell - Lease

IBM

S/34
S/36
S/38

UPGRADES
CPU's CRT's PRINTERS
ALL MODELS
PURCHASE/LEASEBACK
SHORT & LONG TERM LEASES

CMA

Computer Marketing of America, Inc.
P.O. Box 71
610 Bryan Street
Old Hickory, Tennessee 37138

1-800-251-2670

In Tennessee: 615-847-4031

* * * * DEC * * * *

BUY—SELL—LEASE—TRADE—CONSIGN
SYSTEMS — PROCESSORS — OPTIONS
PERIPHERAL — MODULES — MEMORY
— SPARES —

NATIONAL COMPUTER EXCHANGE

(800) 624-9299

600 North Lunar Avenue, Brea, CA 92621

(714) 990- 5988

MISSISSIPPI CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by the CDPA, 508 Robert E. Lee Building, Jackson, MS 39201 for the following data processing equipment and services:

Request for Proposal No. 967, due Tuesday, December 18, 1984, 3:30 p.m., for the acquisition of a distributed processing minicomputer system for the UNIVERSITY OF MISSISSIPPI to function with the campus IBM 4341 Group II computer.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

Dorothy Hooper or Elaine Knauss,
State Central Data Processing Authority
601/359-1306

WE HAVE COMPLETE IBM Systems 34, 36, 38

Price for "NEW" 38 can't be beat! 3180's

"NEW" MEMOREX AMBER SCREEN CRT

SPERRY PERSONAL COMPUTER

IBM PERSONAL COMPUTER
PC, XT, "NEW" PC AT

WE WILL SELL | IBM,
WE WILL LEASE | SPERRY,
WE WILL RENT | Equipment
WE WILL BUY

WANTED TO BUY — UTS 30's
WE PAY TOP PRICES!

Modems for point to point or multipoint • Modem Eliminators • • Line & Port Sharing Devices • • Multiplexers • Wholesale Prices • • Dealer Inquiries Invited •

Pearl Computer Division

• WE ARE A FULL LINE DEALER •

• P.O. Box 24026 • 4717 Centennial Blvd. •
• Nashville, Tennessee 37202 •
• Telex: 554038 • Telephone: (615) 385-1783 •

IBM SERIES/1

S/34 • S/36 • S/38 • 4300
5110-5120 • S/32

BUY • SELL • LEASE
All models, systems & peripherals AVAILABLE NOW!
Ask about our 72 hour upgrades.

(408) 425-7333

SOURCE DATA PRODUCTS, INC.

FOR SALE

5381-581
55%

3262-B01
$8,000.00

Dana Marketing, Inc.
213/212-3111 (In California)
800/433-4148
203/359-8040 (In Connecticut)

DEC 2060

Processor KL8, 2 Megawords memory
2 RP20 Disk drives
RP06 System disk
8 DH11 16-Line terminal interface
2 DN20 Communications Front End

For Sale or Lease
Delivery Negotiable

Contact: Gerald St. Amand
(317) 263-7158

Buy & Sell Your Equipment in BUY-SELL SWAP.

Call COMPUTERWORLD
To Place Your Ad
1-800-343-6474
In Mass. (617) 879-0700

BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP

IBM SYSTEM/34

S/3 • S/32 • S/38
5291 • 5251
3741 • 3742

BUY • SELL • LEASE
REFURBISHED • RECONFIGURATED
SHORT-TERM LEASES
PURCHASE/LEASEBACK

Tennecom MARKETING INCORPORATED
210 SPACE PARK NORTH
P.O. BOX 240
GOODLETTSVILLE (NASHVILLE)
TENNESSEE 37072

800-422-1004
IN TENNESSEE CALL (615) 859-3872

SYSTEMS
4341 4331
38 36 34
32 3
BUY • SELL • LEASE
COMPUTER BROKERS, INC.
2978 SHELBY ST.
MEMPHIS, TENNESSEE

CB

SERIES 1
Call
TOLL-FREE
800-238-6405
901-372-2622
PERIPHERALS
3203 3370
327X 3411
3350 3420

asca AMERICAN SOCIETY OF COMPUTER DEALERS

WHY FORTUNE 500 COMPANIES LEASE FROM RANDOLPH.

1 FINANCIAL STABILITY. As an important part of the Bank of Boston, one of the nation's oldest and leading financial institutions, Randolph has a built-in financial stability that continues to be unique in the third-party computer leasing industry.

2 19 YEARS IN THE BUSINESS. Randolph has been serving Fortune 500 companies since 1965 . . . a history that gives added assurance that we'll continue as a leader in the industry.

3 HIGH-TECH LEASING IS OUR ONLY BUSINESS. Leasing computers is a lot different than leasing boxcars. Computer technology changes almost daily and with it the value of the equipment. Randolph not only keeps current on the state of the art but has learned to anticipate important changes.

4 ACTIVE REMARKETING DIVISION. Our unique customer support assures maximum return on investments in computer equipment which is no longer in use.

5 UNIQUE SERVICE. In addition to the manufacturer's service Randolph has a technical staff that is on call to help reconfigure systems to meet the changing requirements of large companies.

6 COAST-TO-COAST RANDOLPH. Even though large companies may have computer sites all over the country Randolph is right there to serve them. We presently have customers in over 300 cities and towns from Maine to Hawaii.

7 WE SPECIALIZE IN SOLVING PROBLEMS. Large companies can have a variety of problems . . . like machines installed on a rental basis, being stuck with a lease on an old machine or long waits for delivery. Whatever the problem, we can tailor a lease that will fit the need.

8 WE ARE DP PROFESSIONALS. At Randolph, our people have an average of 18 years in the DP industry . . . from 360's to 3084's. They know all about alternative financing to be sure, but they also know their way around a DP department and the hardware in it.

9 WE GO BEYOND COMPUTERS. Randolph has been dealing with peripherals from the very beginning. Now we're involved in leasing communications systems and office automation equipment because that's what Fortune 500 companies demand.

10 WE SAVE THEM MONEY . . . LOTS OF MONEY. Randolph has been saving its customers 30% to 70% of their DP hardware dollars. Fortune 500 companies know leasing is still the most financially attractive method of acquiring computer equipment at low cost without draining working capital.

HOW ABOUT YOU? What we've done for so many of the Fortune 500 companies we can do for you. Call Joseph B. Kelly, Jr., Executive Vice President, 800-243-5307.

537 Steamboat Road
Greenwich, Connecticut 06830
203-661-4200 • 800-243-5307

Randolph

A MEMBER OF COMPUTER DEALERS & LESSORS ASSOCIATION RANDOLPH COMPUTER CORPORATION A subsidiary of THE FIRST NATIONAL BANK OF BOSTON BANK OF BOSTON

3725's AVAILABLE IMMEDIATELY!

Centron DPL has 3725's available for immediate delivery configured to your specifications. Talk with one of our communications specialists today.

Centron DPL Company
7480 West 78th Street
Minneapolis, MN 55435
612/944-9161
Toll-Free 1 800 532-7532

Leaders from the Front End Out.

THE SOURCE FOR series/1

DONOCOM

• BUY • SELL • LEASE
NEW OR USED

(901) 767 9130 or
(800) 238 3098

AEL

BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP

LEASE • PURCHASE • SELL

IBM SYSTEMS

- *Purchase-Lease Back*
- *Customized Leasing*
- *Upgrade Flexibility*
- *All models & peripherals*

CALL US TODAY

612/936-0226

WINTHROP RESOURCES CORPORATION

Computer Sales and Leasing Division

5100 PUSCENTER • 9900 BREN ROAD EAST • MINNETONKA, MN 55343

PRICE BUSTERS!

S/36 IBM S/38

Who You Gonna Call?

CALL CARLYN!

800-828-4227

in VA 703-642-1950

CARLYN

COMPUTER SYSTEMS

5105O BACKLICK ROAD, ANNANDALE, VA 22003

CLIP AND MAIL

ECONOCOM

SERIES/1
BUY • SELL • LEASE
NEW OR USED

3262-B1 $9600

INVENTORY SALE

SYSTEM/36
• EXCLUSIVE VAR AGENT
• SPECIAL 36 MO. RATES
• ANY SYSTEM WITHIN 60 DAYS
CALL NOW FOR DECEMBER INSTALLATION

DISPLAYWRITER SPECIAL
65% OF LIST
75% OF LIST

SPECIAL
• 3178—24 MO 36 MO. RATES
• 3276/1—ALL EXTENSIONS

WANT TO BUY
• 3803-2 • 3420's
• 3830-2 • 3881-K
• 3360's • 3863-J
• 3680's • 4341
• 5291-1 • 5224-2
• 3375's • 5340-F

SPECIAL
3420 LEASE RATES ON INTERSE 3400 IMPLEMENTATION—
CALL FOR DETAILS

DECISION DATA
• 3791-1 • 6783-35
• 3751-1 • 6857-36
• 5791-1

ECONOCOM IN MANY INSTANCES, "RIGHT IN YOUR OWN BACK YARD"

CLIP AND MAIL

3270 COMPATIBLE

A T & T Teletype 4543

Remote SDLC
Standalone CRT
with Printer Port.

$1,900.00 ea.

Each of these rugged, reliable units consists of a CRT with an expanded keyboard and a built-in controller which provides complete 3270 SDLC compatibility. A controller port allows a variety of printers to operate as a 3287.

If you need a CRT and a printer at multiple remote sites on an SNA or SDLC network, this is a perfect solution at a remarkably low cost.

Built by A T & T to A T & T quality standards.

Contact: Dan Davis, Commodity Exchange Services
Box 1980, Lubbock, Texas 79408
806 / 747-6888

DEC

RENT • BUY • UPGRADE • SELL

PDP, 11/03, 11/04, 11/23, 11/24, 11/34, 11/44, 11/70, VAX/730, VAX/750, VAX/780

SYSTEMS • OPTIONS • SUPPLIES

Short/Long-term Rental

Customized Configurations—Call With Your Request.

In Stock	Specials	In Stock
11/24-BC	11/70 (new) $18,000	LP11-EA
11/04-DC	DZ11-BP (new) ..... $ 1,000	LP11-VA
1134A-YE	LA120-DA (remanufactured) ..... $ 1,000	MS11-PB
11X44-DA	RA60-AA (new) $13,000	RK611-EA
BA11-KU	RP05-AA (new) ..... $ 5,000	RM03-AA
DW750	RP07-AA (remanufactured) $19,000	RM05-AA
DZ11-F	RA60-CA (new) $16,150	RP06-AA
H9642	TU80-AA (remanufactured) ..... $ 8,000	TS11-CA
LA12-AB		TWE16-AA
LA120-RA		VT220-AA

CALL FOR OUR FREE CATALOG

DEC is the registered trademark for Digital Equipment Corp.

BROOKVALE

800-645-1167

Inflation Fighters

Quality & Savings

Slightly used. Money Back Guarantee. Full Reels. All External Labels Removed. Guaranteed for use at 800 BPI through 6250 BPI.

2400' Reel $4.95 ea.
1200' Reel $4.25 ea.
600' Reel $3.50 ea.

All Tapes with Hanging Seals

We pay freight on orders over 200 tapes. All orders shipped within 48 hours.

Call or Write

Computer Tape Mart
44A Seabro Avenue
N. Amityville, New York 11701
[516] 842-8512

WANTED
To Buy Or Lease
IBM
2972 Control Units
2980 Mod-4 Terminals
2980 Mod-2 Terminals
Call
(812)-464-6724

SELLING?

Sell your product or service in Computerworld classifieds. Join the thousands of advertisers who use our classifieds because they get results. You can find buyers for discs and DEC's, terminals and timesharing, software and System 370's. More than half a million active computer people read Computerworld each week, and you can reach them efficiently in Computerworld classifieds. To place your ad, or to get a rate card with complete details on Computerworld Classifieds, call or write:

Classified Advertising
Computerworld
P.O. Box 880
Framingham, MA 01701
1-800-343-6474
617-879-0700

BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP

CMI

AMERICA'S LEADING SPECIALIST SERVING THE USED MARKET

Absecon, NJ (609) 646-7262
Boston, MA (617) 367-6755
Chicago, IL (312) 693-2799
Dallas, TX (214) 386-6666
Encino, CA (818) 789-8113
Houston, TX (713) 780-7469
Irvine, CA (714) 752-9443
Lebanon, TN (615) 449-6633
Miami, FL (305) 442-3666
Monmouth Beach, NJ (201) 222-0750
Tampa, FL (813) 273-0026
Frankfurt, Germany Telex: 6867673 LCO D
Montreal, Quebec (514) 671-1121
Nyon, Switzerland Telex: 27260 CMI CH
Paris, France Telex: 214000 CMI FR
Toronto, Ontario (416) 843-3086
(416) 669-9400 (Headquarters)
Vancouver, B.C. (604) 685-6186

CMI FINANCIAL SERVICES GROUP
2600 Telegraph Rd., P.O. Box 2026
Bloomfield Hills, MI 48303-2026
(313) 456-0000

CMI

A Torchmark Company
2600 Telegraph Rd., P.O. Box 2026
Bloomfield Hills, MI 48303-2026
TWX/TELEX: 810-232-1667 CMI CORP. TRMI
(313) 456-0000
Member ASCD Member CDLA

3083 All Models

3081 All Models

Short Term **4381** Leases Available

Remote Job Entry
3776, 3777
3783, 2782
Buy, Sell, Lease
All Models
Immediate Delivery

New Series 1 with Sorts Operating System "Links" to on the Series 1
IBM Master VAR
TM Trademark of Sort Laboratories

3380 Available Now On Any Short Term Lease 3370, 3380, 3375

3600-A6 Available Now
4700 Banking Equipment Buy/Sell/Lease

IBM
Full System 7 Class™ on The IBM Series 1
- Available Immediately
- Over 230 Utilities
  - Electronic Mail
  - Visual Editor
  - Punchout Code
  - Sampling

SYSTEMS 1 INC.

3800 LASER PRINTERS
Model 1's Immediate Delivery
Model 3's Lease Financing
Available-Any Term
3800-6 3211-1 & 3611-1
4248 4245-1

Trades Immediate Delivery 3083 - 3420 Buy/Sell/Lease
3420 Delivery Positions Available

For Sale/Lease **4341-1** **4341-2** Call Now

3278, 3279
3178, 3276
Terminals
All Models
Immediate Availability

3705-3704 Available for Immediate Delivery Sale or Lease

System 36/38 New/Used Available Now Long & Short Term Leases System 34 & 5100 BUY/SELL/LEASE

4955-F's Immediate Availability

CPU/VAX* DEC
BUY SELL MEMORY*
PRINTERS* LEASE
UPGRADE DISC-TAPE DRIVES*
*
1-800-328-0004

desco
a data 3 company

IBM
5110 5120
3741 3742
DATAMASTER
1255 MICR
SYSTEMS
34 36 38 32 23
All Associated Peripherals
BUY SELL LEASE
- Printers - Display Stations
- Upgrade & Factory Add-ons
- Trades Taken
- IBM Maintenance Guarantee

Call Today for Quotation
(615) 259-5505
SOUTHERN DATA SYSTEMS
Nashville, Tennessee

When You Think Of Leasing Anything, Think Of Comdisco

For Sale Or Lease

3083/3081 3178 318 327·
4331/4341 3800-1 3
3380/3880

3370 3375

3420-4 -6
3803-2
3725
4245 4248

Wanted To Buy

3083/3081 3350 3
3287 803-

COMDISCO

FORSYTHE McARTHUR ASSOCIATES, INC.
NEW LEASE PROGRAM
3178, 3179, 3180
2 Or 3 Year Term Low Monthly Rent
Customized Flexibility
Hdqtrs: Skokie, IL (312) 675-8000
Atlanta (404) 953-9457 Milwaukee (414) 785-9544

IBM SYSTEM Sell **34**
S/1 UPGRADES Lowest Prices
Call Collect: 404-252-7480
We Pay Highest Prices For S/34's, etc.
DATAMARC
6000 Peachtree Rd. Suite 300 Atlanta, GA. 30328
S/38

BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP

WE BUY • SELL • LEASE

JOIN THE MANY FORTUNE 500 COMPANIES THAT UTILIZE IBM EQUIPMENT FROM TEXCOM... THE IBM SPECIALISTS

1331 1311 • 1361 1381

We buy, sell or lease • 2, 3, 4 year leases

WE'VE GOT IBM PERIPHERALS

3803	3375	3880	3350	3203	3811
3420	3380	3340	3370	3211	3262

IBM S/34 - 36 - 38

All upgrades available now • 1, 2, 3 year leases
We'll take S/34 trade-ins

WE'VE GOT ALL IBM PRINTERS AND TERMINALS
PLUS 3864 MODEMS NOW

SERIES 1

All features and peripherals • Convenient leases
We buy, sell or trade

WE WANT TO BUY

IBM PC's – IBM XT's AND
IBM DISPLAYWRITERS

TexCom

CALL TOLL FREE: 1-800-833-6119 (PURCHASE)
SAN ANTONIO (512) 349-6955 (LEASING)
MEMPHIS (901) 795-7655 (LEASING)

ASCD CDLR AEL

DON'T MISS THIS TERMINAL SALE

SCHERERS

LET'S GET ACQUAINTED
TERMINAL SALE

DEC TERMINALS

PRICES SO LOW
WE DARE NOT PRINT THEM!!!

IF YOU SNOOZE —
YOU LOSE!!!

Immediate Delivery | Full 90 Day Warranty | In Stock

(614) 889-0810

Brand New
- VT100
- VT101
- VT102
- VT131
- VT125
- VT220
- VT240
- VT241
- LA12
- LA50
- LA120

Prices subject to change without notice

DON'T MISS THIS TERMINAL SALE

The State of California is interested in purchasing a geographical mapping system for under $75,000. A turnkey workstation approach to include a digitizer, processor, disk storage, mag-tape unit, and printer is preferred. Qualifying systems must have minimum 6 months in field installation.

Contact:
Department Of Conservation
1416 9th Street
Sacramento, CA 95814
Attn: Dan Hammond
(916) 323-0692

MODEMS

3375's
A1, B1, B1, D1
Available 12/1/84
Sale/Lease

4341's
Lease Terms 1-5 Yrs.
4381's
Sale/Lease

Printers
3800 3811 1403
3820 4245 4245
3262 3820 3287
Immediate Delivery

Controllers
3880 3274
3803 3276
Display Stations
3278 3178
3279 3277

DASD
3380 3375
3370 3350
3344 3310
Immediate Delivery

TAPE DRIVES
3420 3430
3410 8809
Immediate Delivery

We Buy, Sell & Lease IBM Processors and Peripheral Equipment

Computer Marketing Inc.
P.O. BOX O
MARGATE, NJ 08402-2223
609/823-6000 • 800/345-0005
Contact/Bernie Gest
CDLR
Established 1968

STRATUS
FT 200
Available Immediately
Robert Gold
(212) 344-7405

I B M

SYSTEM 36

New Processors
Printers & Displays

Priced Substantially Below IBM List

Software Included

Order Now For Delivery Before Year End

LIBERAL TRADE IN ALLOWANCES

CPU SALES & LEASING, INC.
205 NORTH PAGE STREET
PORTLAND, OREGON 97227
NATIONAL 800/222-2226
OREGON 503/222-2226

ASCD MEMBER: AMERICAN SOCIETY OF COMPUTER DEALERS

CPU

OUR SERVICES CAN HELP YOU CONCENTRATE ON MORE IMPORTANT BUSINESS.

Lease • Sales • Brokerage

DEC: 10, 20, 11, VAX
Emulex: Controllers
Optimux: DMF 32
National Semi Conductor Memory
CDC: Disk
STC: Tape
Depot Repair Center

Digital Business Inc.
P.O. Box 61488/Atlanta

BUYING?

Whether you're looking for big computers little computers, terminals, printers, software, time sharing or services, you'll find it in Computerworld classifieds.

Pages of ads every week, with everything from Discs to DEC's from time sharing to terminals, and software for every size computer system.

You'll find what you need in Computerworld classifieds.

Call 800-343-6474 (or 617-879-0700) for more information

FORSYTHE McARTHUR ASSOCIATES, INC.

NEW LEASE PROGRAM

IBM 4381

2 Or 3 Year Term
Customized Flexibility

Low Monthly Rent
Your Delivery Position Or Ours

Hdqtrs: Skokie, IL (312) 675-8000
Atlanta (404) 953-9457 Milwaukee (414) 785-9544

C.D. SMITH & ASSOCIATES, INC.

DEC computer systems & options
12605 East Freeway, Suite 318
Houston, Texas 77015
(713) 451-3112
TELEX 76-2547

DEC

WE ARE SELLING:
VAX 11/730, 11/750, 11/780
& MOST VAX OPTIONS

ALSO:
730, 750, 780 CPU's
780 w/785 Upgrade Option
725 Systems
RA60, RA81, RA82, TU58
FP730, FP750, FP780-AA
MS730, MS750, MS780 Memories
H7112-A, H7100-A, DW780-AA
H9652-HA, H9652-MF, H9642-FA
RLV22-AK, RL02-AK, DZ11-E, TM78-C

Call, if you want on our Mailing List
(713) 451-3112

---

computer systems/ graphics, inc.

STC
MEMOREX
CDC

TAPE • DISK • CRT
PRINTERS

We Trade Them All

Tom Lynn

913+ 492-1442

9825 Widmer
Lenexa, KS 66215
CDLR

BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP

SERIES/1

SAVE UP TO 60%

CPU's • PERIPHERALS • ALL MODELS

IBM PC's

AT's & XT's

Rental • Lease • Purchase

Excellent Availability — Substantial Savings

System/34 • System/38

TOP SAVINGS • QUICK DELIVERY • SHORT AND LONG TERM LEASES
MEMORY • FEATURES • UPGRADES

IBM System/36

ALL MODELS — QUICK DELIVERY

Special Option+Plus+Lease™ Plan

CALL TOLL FREE **800/328-5718**

IN MINNESOTA 612/544 • 8660

COMPUTER OPTIONS, INC.

1660 SOUTH HIGHWAY 100 • MINNEAPOLIS, MN 55416

COI "Your best option"

DATA GENERAL

Hanson Data Systems

BIDS & PROPOSALS

Computer System For sale by tender

Digital PDP 11/40 computer system consisting of:
11740-AA Computer system
TJU16-EA Magtape subsystem
LA11-PA Printer subsystem
and all related equipment

For further information, contact Mr. Bruce Potten, B.C. Hydro, 970 Burrard Street, Vancouver, B.C., Canada V6Z 1Y3. Telephone (604) 663-2082.

Bid forms may be obtained by contacting B.C. Hydro Disposal Dept. at (604) 291-2211, local 301.

Sale is "as is, where is" and subject to B.C. Hydro Conditions of Sale. All bids due in the office of Disposal Agent, 3855 Kitchener St., Burnaby, B.C., Canada V5C 3L8 by noon, Thursday, December 13, 1984. Please quote reference no. C-727.

B.C. Hydro

Make your call for BIDS & PROPOSALS here in COMPUTERWORLD.

Call 1-800-343-6474 or, in Mass., (617) 879-0700

The County of Beaver, Pennsylvania is seeking to upgrade its data processing equipment and wishes to purchase/lease the following:
1. IBM 4341-A02 processor (8mb), 6 channel with IBM 3278-2A display console and remote support facility
2. (2) IBM 3375-A1 DASD and (2) IBM 3375-B1 DASD
Additional the County is offering as a trade in or cut right sale the following equipment:
3. (1) IBM 3348 DASD, (3) IBM 3844 DASD and (1) IBM 3370-A01 DASD
This is a public bid and all proposals must be received on a County bid form by the Beaver County Controller, Beaver County Courthouse, 3rd Street, Beaver, PA 15009. No later the 4:30 p.m., December 3, 1984. Specification and bid forms may be requested from the County Chief Clerk at (412)728-5700 ext. 203. Bidders may bid on each configuration independently or may submit one consolidated bid.

The Bulletin Board

Buy • Sell • Lease Buy • Sell • Lease Buy • Sell • Lease Buy • Sell • Lease

IBM

BUY SELL LEASE TRADE
S/34 S/36 S/38
Available Now All System 34 Upgrades And Features
5340-C23, E35, F37
5360s All Models
3262s
5256 Model 3s
5251 Model 11s
5291 Model 1s
5251 Model 12s
Immediate Delivery - Guaranteed IBM Maintenance
PROCOM
"The Professional Computer People"
(212) 279-1717

For Sale
IBM SYSTEM 34's
Any Model or Configuration
Disk and Memory Upgrades
Available Within 30 Days
5340-C23 $3,500
Eligible For IBM Maintenance
Call Pat
(313) 652-2260 ext. 5

IBM

SALE/LEASE
3747-1
w/1480, 1680, 3880, 7500, 7505
3704-A4
3705-M83
Call Matt Blaustein
(914) 238-9831
Computer Merchants Inc.

FOR SALE
4341-M2
8 MB Processor
w/3278 Console
Available Now
Call Bill Cahill
Computer Merchants Inc.
(914) 238-9831

FOR SALE
4331-K2
w/3350 Attachment
Comm. Lines Available
Call Bill Hagen
Computer Merchants Inc.
(914) 238-9831

IBM

FOR SALE
3803-2
With or without features
Sitting and refurbed
Call Jon Kendall
Toll Free 800-328-6729

For Sale Or
IBM System 34
128 K, 64 Mg, Magazine Drive, Printer 5211-1, (4) CRT 5251
Best Offer
Fritz Milner (404) 455-1234

SALE/LEASE
3880-1 w/8170
3830-2
w/2150, 2151, 6111, 8170
3370-B1
Call Howard King
(914) 238-9831
Computer Merchants Inc.

IBM

Buy .....Sell..... Lease
IBM MICR
3890 - 1419
1255 - 3694
(613) 722-4534

CABLES
Series/1
System 34/36/38
IBM PC's
Pioneer Cable Company
(316)665-6811

FOR SALE
4341-L11 $40,000
4341-K9 $20,000
Each with 3278-2A console
Available Now
Call Steve Keith
(215) 921-2100

IBM

3278-2/5 3278-2/12
You call today
We ship tomorrow

Sale or Lease One or Fifty

Month to Month Rental Available

Express Leasing Inc.
San Diego
(619) 487-8030

Fox Computer Sales
Buy • Sell • Rent • Lease
Datapoint • IBM
Teletype
W.T.B.: Used Equipment
(216) 449-5205

IBM

SYSTEM/36
Disk • Memory • Communications
Upgrades
3100s & 5262s
December Availability
(713) 627-7117
(212) 279-4487

More Bulletin Board on the next page.

The Bulletin Board

BURROUGHS

BUY SELL LEASE
BURROUGHS
Equipment Dealers
Since 1977
Over $4,000,000
In Stock
Computer Provisions
(216) 248-7878
(Member IBDA)

BUY • SELL • LEASE
B1700 • B1800 • B1900
(Custom Config. Install. Avail.)
B80 through B7900
200/207/225/238 Disk
(82)40/47/48 Printers
Mag Tape Subsystems
TD830 - MT850 - SNY - Datamax
TUDC/CRT Terminals
Installation & DEPOT MAI Available
MFP Corp. (216) 979-1100

DEC

FALL SPECIALS

CDC 9766, Refurb	$4,500
LA 38, Unused	399
LQ008, Used	3,000
LP14-CA, New	6,900
RA80-AA, Unused	9,800
RM05-AC, Used	12,000
RP07 (50 HZ-60 HZ)	17,000
TS11-CA, Unused	2,999
TU78 Master, Unused	27,500
VAX 780XA-AE, New	121,500

DEC cables/Pins computers available
SEVCO INC.
(617) 436-0030
(617) 485-0551

DEC BARGAINS

11/34A CPU Set	$1,495
11/44 KE44-A "CIS"	$2,775
11/44 CPU Set KD11Z	$4,000
BDV11-AA	$395
DL11-W	$245
DR780-AA	$6,500
RP11	$1,175
RP11A	$1,575
RK11-A	$1,600
MK11-DE	$1,000
MS11-LD	$775
MS11-MB	$900
MS11-PS	2,500
MS780-DD	$3,500
MSV11-LP	$750
MSV11-PL	$1,375
VAX 1MB MS730-CA	$1,875
VAX 1MB MS750-CA	$1,875
VAX 1MB MS780-FD	$2,300

Call Ray at CIS, Inc. (617) 275-0000

DEC

We Buy and Sell DEC Systems and Components.
Wanted:
VAX and 11/70 Processors.
Alphabyte
550 S. State College Blvd.
Fullerton, CA 92631
(714) 680-6511

DEC NEW & USED
BUY - SELL - EXCHANGE
Systems • Processors • Memory
Options • Peripherals • Modules
LAKEWOOD COMPUTER CORP.
P.O. Box 58879
San Jose, CA 95159
(408) 289-3240

VAX 780
Immediate Availability
Short Or Long Term Leases
Brookvale Associates
800 645-1167
New York (516) 273-7777

D.E.C. SPECIALS
VAX 11/780 8 MB $250,000
1170 Core 1/2 MB $35,000
(3) RP04 s, (1) TWU16, (1) DH11-AD
RP04 Spare Parts Call
Polstar Computing Services Inc.
P.O. Box 288
Plantsville, CT 06479
(203) 621-0000

NEW DEC SYSTEMS
40% OFF LIST
MICRO/PDP-11 $8000
10 Mag Winchester RD51
1 RX50 Floppy Drive
256 KB Memory
DZV11-DP 4 Line Controller
General O.S. Licenses
11/70s, Other Configurations
Call BBC Systems (617) 449-0100

"Buy"-"Sell"-Lease"-Maintain"
New & Used
DEC Equipment
Southwest Automation
Houston, Texas
713/988-6210 Inside Texas
800/231-0769 Outside Texas

DEC
U.S. RESALE CORP.

AR11-KT	KDF11-AA	MM912	
DLV11-J	LA35	RXV11-BA	
DZ11-A	LA34	RXV21-BA	
FDF11-A	MSV11-DD	RX02-BA	

VAX MASSBUS COMPATIBLE DISKS
RP06 - RM05 - RP07
9 Mb - 9 Mb - 516K
(408) 737 - 1113

BUY • SELL • TRADE

11/23	KMC11-A	RM05-AA	
BA11-KE	KMC11-B	RM05-AC	
BA11-KU	LA180-DA	RM05-C	
BC26V-50	LP11-CA	RX211-BK	
FP11-F	RA60-CA	TS11-BA	
H7112-A	RA81-AA	VT220	

NEW YORK COMPUTER EXCHANGE
(516)752-0000 (800)645-6100

DEC

RM05
2 Drives w/Controller
$20,000 w/DEC Reinstall
ACUDATA/CSG
(207) 622-4769

3 CDC 9766's
$3,500 Each
Controller Available
ACUDATA/CSG
(207) 622-4769

PRO350 - $4,500
- 512K
- COLOR GRAPHICS
- 5MB HARD DISK
- 2-400 KB FLOPPIES
- 3 EXPANSION SLOTS
- RS232 ASYNC/SYNC
- + + SOFTWARE + +

Roy Walsh (303) 292-6722

WANG

DESIRABLE EQUIPMENT-
AVAILABLE NOW!!!

(1)	Wang VS-80 1 Mb CPU & IOPs	CALL
(1)	Wang 5574 1100 l pm Band Printer	22,000.
(2)	Wang 5573 250 l pm Band Printer	5,500./EA
(1)	Wang 2200-V Dual Density Tape Drive	9,800.
(2)	Wang 2285V-2 [illegible] Mb Disk Drive	12,500./EA
(30)	Wang Ergo-2 32K O.P. Workstation	1,800./EA

ALL UNDER WANG MAINTENANCE AND AVAILABLE NOVEMBER & DECEMBER.
SUBJECT TO PRIOR SALE.
Call Dwight Kraus
(617) 372-8538.
CFR Associates, Inc.
Haverhill, MA 01830

EQUIPMENT AVAILABLE
VS85
6 MONTHS OLD
GENESIS EQUIPMENT MARKETING
(800) 377-[illegible]

WANG

ERST Is The Leading Dealer
In WANG Equipment:
2200 • VS • WP • PC
CPUs, Terminals, IOPs,
Controllers, Printers,
Memory Upgrades.
Plug Compatibles.
Rental And Leasing Prices
Quoted On Request.
Call Toll Free:
1-800-FOR ERST
In New York: (212) 431-1100
ERST International
Corporation
225 Lafayette Street
New York, NY 10012

WANG VS SOFTWARE SPECIAL
Limited Time Offer
MCBA • CURRENT RELEASE #3
$1,500 Per Package
A/R, A/P & G/L
CONTRACT PROGRAMMING
AND CONSULTING SERVICES
CLIFF DATA SYSTEMS, INC.
(301)499-[illegible] (212)910-[illegible]

PRIME

LARGE SELECTION OF USED
PRIME COMPUTER SYSTEMS
...SAVINGS TO 50%
Peripherals also available
1st SOLUTIONS, INC
2001 EAST CAMPBELL AVE.
PHOENIX, ARIZONA 85016
(602) 957-0999
ASK FOR DON OR MATT

MISC.

FOR SALE
7 Burroughs
Disk Drives (225)
2 Burroughs
Controllers (365)
1 Burroughs Controller (363)
19 Burroughs Media (225)
26 Burroughs Media (235)
1 Calcomp 960 Plotter
& 925 Controller
Contact:
T. Sideris
(212) 839-1628
D.W. Johnston
(212) 839-1626

MISC.

BUY - SELL - LEASE
DATAPOINT
HARDWARE & SOFTWARE
•Turnkey Systems •FAMIS Software
On-Line Accounting
(713) 529-9613

Buy • Sell • Lease
• Short Term Rentals •
IBM & DATAPOINT
AVAIL IMMEDIATELY
Cougar Computer Corp.
(216) 381-3600
Member CDLA

HONEYWELL

LEVEL 6 & DPS 6 EQUIPMENT
NEW & REFURBISHED
Systems • Peripherals • Memory
CRTs • Applications Software
ANNOUNCING 5 COMPATIBLE
L6/DPS6 PRODUCTS
• 1000 And 1500 LPM Band Printers
• 256/288 MB Winchester Disk Drives
• 6A7800 CRT (Synchr/Asynch)
Emulation
VIP 7801/2, 7804/5 And 7814
Low Prices - Prompt Delivery
Boudreau Computer
Services Ltd.
100 Bearfoot Rd.
Northboro, MA 01532
(617) 393-0330
TWX 710-347-7574

DATA GENERAL

NPA SYSTEMS, INC.
SPECIALS: MV8000's - 1 MB
Max Memory (new)
S/280's - 1 MB (new)
S/140's - 1 MB
CRTS: D-210, D-211, D-410
CALL FOR INFORMATION:
516-467-2660

DG/ONE PORTABLE
Desktop Generation • CRTs
Immediate Delivery
Systems, Software, Service
Copley Systems
(617) 769-9430

DATA GENERAL

Eclipse C330
320 Kb Memory, 192 Mb Disk,
800 BPI Tape Drive,
(12) 6053 CRTs, (1) ALM 8,
(1) ALM 16, Etc.
Call Chris McCurry At
(916) 444-8086, Ext. 15,
Between 6 AM And 1 PM
Pacific Standard Time.

HEWLETT PACKARD

Buy-Sell-Lease
HP3000 3X, III, 4X
and related peripherals
Call Carol
CSU INDUSTRIES, Inc.
516-239-4310

HP 3000
BUY • SELL • RENT • LEASE
Complete Systems
Processors • Peripherals • Parts
CenAm Corporation
Santa Monica, California
(213) 458-3643 (800) 643-4964
Telex: 215 604 PCS UR

MISC. SYSTEMS

PIXEL
SUPER MICRO SYSTEM
16 User,
10MHz 68000 Processor,
1MB RAM, 40MB Hard Disk,
Mag Tape Back-Up,
UNIX Op System,
Fully Upgradable

CROMEMCO SYSTEM 2
Z80 with SDI Graphics
for RGB Monitor
Demo Units in excellent condition
Call Craig Brooks
SMS Data Products
(703) 827-0640

Inforex 1303-I
Key To Disk Data Entry System
(4) Work Stations w/ Side Cabinets
2.5 Meg 24 K
Maintenance Certified
Good Condition
Available January Best Offer
1-800-521-4339 Ext. 460

SOFTWARE FOR SALE

IBM SERIES/1
TERMINAL DOUBLE DUTY!
H&A's RS3270 Emulator allows common S/1 terminals to sign on as 3277's, interact with a mainframe application, & then return to native S/1 duty. DOUBLE DUTY. Easy to use and install.
H&A COMPUTER SYSTEMS
(415) 434-3617
SERIES 1

LPCUT
A Proven Name-and-Address Processing Utility to:
- Format & Print Labels
- Select Input Records
- Reformat Records
- Create Customized Listings
- Translate, Pack or Unpack Selected Fields
- Insert Sequence Numbers & Literals

Call or Write:
List Processing Company
555 Waters Edge
Lombard, IL 60148-5494
1-800-MAILERS
In Illinois (312) 932-7000

[illegible]
- Easy to use menus
- Book and tax depreciation
- Multi-division or multi-company
- Disposal reporting
- Property tax reporting
- Depreciation forecasting
- Acquisition reporting
- Interfaces to General Ledger
- For VAX VMS or RSTS E
- Datatrieve compatible

Plycom services, inc.
P.O. Box 160
Plymouth, IN 46563
EAST (317) 743-5580 WEST (214) 986-0507

SELLING SOFTWARE?
SELL IT HERE.
Place your ad in the BUY-SELL-SWAP pages of COMPUTERWORLD
1-800-343-6474 or
(in Mass.) (617) 879-0700

SOFTWARE FOR SALE | SOFTWARE FOR SALE | SOFTWARE FOR SALE | SOFTWARE FOR SALE | SOFTWARE FOR SALE

SOFTWARE CONVERSION SOLUTIONS

Datasware provides the software translation system for your complex conversion problems. Over 15 years of conversion experience has resulted in thousands of satisfied customers, worldwide

- COBOL to COBOL
- AUTOCODER/SPS to COBOL
- EASYCODER/TRAN to COBOL
- BAL/ALC to COBOL
- DOS/ALC to OS/ALC
- PL/1 to COBOL
- RPG/RPG II to COBOL
- RPG/RPG II to PL/1

Datasware offers services & software to meet your needs. For more information, call or write today

The Conversion Software People
Datasware, inc.
2545 Elmwood Avenue
Buffalo, New York 14217
Phone (716) 876-8722
TELEX 91519

THE SYSTEM/38 AND CRISP

RUN RINGS AROUND THE COMPETITORS CRISP, designed on the System/38 for the System/38, is the one turn-key CUSTOMIZED, FULLY INTEGRATED, ON-LINE, DATABASE, SOFTWARE PACKAGE that utilizes every feature of the System/38. • Sales Order Entry • MRP II • Cost and Financial Accounting • Loading and Dispatching • Inventory Status and Forecasting • Purchasing and Accounts Payable • ...and much, much more.

For additional information on how the System/38 and CRISP can help you, call or write today.

FRIEDMAN & ASSOCIATES, INC.
100 WILMOT ROAD, DEERFIELD, ILLINOIS 60015
(312) 940-7100

AD SPACE For Sale

Call 1-800-343-6474
(in Mass.) (617) 879-0700

or send materials to:

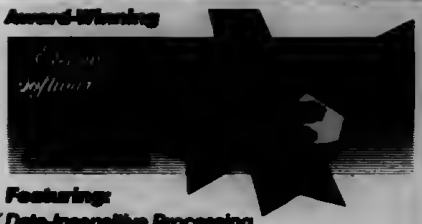
COMPUTERWORLD Classifieds
Box 880
375 Cochituate Road
Framingham, MA 01701

NIXDORF USERS NIXDORF USERS

Run your standard jobs on IBM PC's without reprogramming? The EDE software products are now available at $20/month/keyboard. Mail your order to:

DSI
Box 963549
Plano, TX 75086

Award-Winning



Featuring:

- *Data-Insensitive Processing*
- *Large Scale Integration*
- *User-Defined Vocabulary*
- *Paperless Processing*

General Accounting	Payroll/Personnel
Accounts Payable	Back to Tax Accounting
Accounts Receivable	Order Processing
Equipment & Fixed Assets	Inventory Management
Financial Reporting	Sales Analysis
Planning & Budgeting	Oil & Gas
Job Cost Accounting	Spread Sheet Processor

J.D. Edwards & Company

4649 S. Syracuse / Suite 5000
Denver, CO 80237
303/ 773 3722

Dallas — 214/ 458 0636
Houston — 713/ 880 8278
San Francisco — 415/ 571 5755
Newport Beach — 714/ 985 0116
Bakersfield, CA — 805/ 327 1911
Tulsa — 918/ 493 1477

IBM Value Added Remarketer

TIME & SERVICES

COMPUTER TIME

EXCESS CAPACITY
BELOW MARKET RATES
VOLUME DISCOUNTS AVAILABLE

TIME SHARE

* CMS
* ROSCOE
* CICS
* OS/VS BATCH
* DOS BATCH
* Development Software

Xerox 9700 Laser Printing

Processing Management Systems Corp.
2269 West Desert Cove Ave.
Phoenix, AZ 85029
(602) 246-1156

COMMERCIAL DATA PROCESSING

4341-2 370/158-6

OS-DOS-VM/CMS
CICS-ROSCOE
REMOTE JOB ENTRY
CICS DEVELOPMENT
CUSTOMIZED SOFTWARE
XEROX LASER PRINTING

Contact Greg Gorsh
(201) 777-3464
15 MINUTES FROM LINCOLN TUNNEL
ONE PASSAIC STREET
WOOD RIDGE, N.J. 07075

COMPUTER TIME RENTAL

IBM 4331
DOS/VSE - ICCS
All Shifts Available
3370 Disk, 3420 Tape
Dual/Density
1403-N1,
2540 Reader/Punch
Reasonable Rates
Contact: Al Palmo
Rectangular Data Services
(212) 987-1411

VAX 11/780 AND PDP-11 DEVELOPMENT TIME

NO KILOCORE TICK CHARGES / NO CPU CHARGES

Omnicomputer

$7/$14
RSTS/E VMS

PER HOUR
CONNECT TIME

LANGUAGES & PACKAGES AVAILABLE

BASIC PLUS	WORD-8
BASIC PLUS 2	DIGICALC
PASCAL	SPSS
COBOL	
C	WAFE
PMS	TECO
DATATRIEVE	RMS
FORTRAN	RSX EMULATION
MUMPS	RT 11 EMULATION
MACRO	CUPPS-69

OMNICOMPUTER'S SERVICES

- TIMESHARING
- APPLICATION SOFTWARE SERVICES
- MAINTENANCE SERVICES
- BACK-UP SERVICES
- SOFTWARE DESIGN
- BUY, SELL, AND LEASE SERVICES
- EXECUTIVE SEARCH
- SITE SURVEYS
- MIS CONSULTING
- INSTALLATION SERVICES
- LASER PRINTING SERVICES

BUDGET BYTES®
212-944-9230

Omnicomputer, Inc.
1430 Broadway, New York, N.Y. 10018

LOOKING FOR A TOP JOB ?!?
With a top company ?!? Look to **NATIONWIDE CAREERS** ... the weekly guide to professional advancement opportunities ... at newsstands every Friday.
Or call toll free:
1-800-458-5859.

ICOTECH
Innovative Computer Techniques

COMPUTER SERVICES
IBM 3081 DEC-10

- Remote Job Entry
- Batch Processing
- Optical Mark Reading
- Online Processing
- Timesharing
- Laser Printing

COMPUTER OUTPUT MICROFILM

- Datagraphic MM Auto-Cons
- Datagraphic Datamaster
- 6250 BPI Capability
- Free Testing

Route 202
Raritan, NJ 08869
201-524-0153
Contact: Joyce Bogenske

VAX TIME

CHOOSE THE PLAN BEST FOR YOU
A ● 54 CPU SEC & 82 CONNECT HR
B ● $12 PER CONNECT HOUR
C ● $800/MONTH & 16 MB DISK

NO CPU CHARGES ON PLANS B & C
PROGRAMMING SERVICES AVAILABLE

AVAILABLE NATIONWIDE VIA TELENET

PINCOM CORPORATION (714) 99VAX11 (714) 996-6041

MEMORY REPAIRS

ANY MANUFACTURER
DEC • DG • AMPEX • HARRIS • PE
CA • MICRODATA • CDC • EMM
MOSTEK • INTEL • NATIONAL
PLESSEY • DATARAM • GA
OR ANY OTHER
• LOW CONTRACT PRICES AVAILABLE
• 1 WEEK TURNAROUND
• 90 DAY WARRANTY
• CORE STACK REPAIRS

POWER SUPPLY REPAIRS
ANY MANUFACTURER
OUR 12th YEAR OF SERVICE

DIGITAL DATA SYSTEMS
DDS

DATA CENTER SERVICES

TWO 2 3033L16

BURNS

Paul W. Abrahams, Sc.D., CCP
Consulting Computer Scientist

Systems Software Design and Development - Compilers - Text Processing - Documentation - Standards. 25 years in computer field.

214 River Road
Deerfield, MA 01342
(413)-774-5500

NEED HELP WITH IMS? CALL IMS CONSULTING!

Consulting, training and supplemental staff for IMS DB/DC and CICS/DLI applications using traditional development and application generators.

Information Management Systems Consulting Inc
16530 VENTURA BLVD., SUITE 600
ENCINO, CALIFORNIA 91436
(818) 905-0666

DATA PRINTER SALES

Model's 6644 - 1200 Series
Spares Discounts 10% to 30%
Per Call: Service, Ribbons
Refurbs, Maint Contracts

Printer Consulting Services
P.O. Box 295
Plantsville, CT 06479
(203) 621-8356

CLASSIFIED ADVERTISING ORDER FORM

Computerworld's Classifieds work.

Issue Date: Ad closing is every Friday, 10 days prior to issue date.

Sections: Please be sure to specify the section you want: Time and Services, Software for Sale, Position Announcements and Buy/Sell/Swap. (Available upon request: Software Wanted, Business Opportunities and Real Estate).

Copy: We'll typeset your ad at no extra charge. Please attach CLEAN typewritten copy. Figure about 25 words to a column inch, not including headlines.

Cost: Our rates are $128.10 per column inch. (A column is 2" wide.) Minimum size is two column inches (2" wide by 2" deep) and costs $256.20 per insertion. Extra space is available in half-inch increments and costs $64.05. Box numbers are $15.00 extra.

Billing: If you're a first-time advertiser, (or if you have not established an account with us.) WE MUST HAVE YOUR PAYMENT IN ADVANCE.

Ad size desired: _____ columns wide by _____ inches deep.

Issue Date(s): _____

Section: _____

Signature: _____

Name: _____

Company: _____

Title: _____

Address: _____

Telephone: _____

Send this form to:

COMPUTERWORLD

CLASSIFIED ADVERTISING,

375 Cochituate Road, Box 880,
Framingham, MA 01701

Foreign Editorial/ Sales Offices

England: Martin Durham, CW Communications Ltd., 99 Grays Inn Rd., London WC1 8UT. Phone: 01-831-9252. Telex: 262346.

Euan Rose, Bill Dunlop, Stephen Thomas, Beere Hobson Assoc., 345 Goswell Rd., Islington, London EC1V 7HN. Phone: 01278 3415/6 (reps for all CWCI publications except Computer Management and Computer Business Europe).

W. Germany: Eckhard Utpadel, CW Publikationens, Friedrichstrasse 31, 8000 Munich 40, Phone: (089) 38172-0. Telex: 5215350.

France: Axel Leblois, Computerworld Communications S.A., 185 Avenue Charles De Gaulle, 92200 Neuilly Sur Seine, Paris. Phone: 758.14.14. Telex: 613234 F.

Japan: Mr. Shuji Mizuguchi, Computerworld Japan, 7-4 Shintomi 1-Chome, Chuo-ku, Tokyo 104 Phone: (03) 551-3882. Telex: 252-4217 (Computerworld Japan only).

H. Kajiyama, Tokyo Representative Group, Sanshin Kogyo Bldg. 3F, 2-10 Kanda Jimbo-cho, Chiyoda-ku, Tokyo 101. Phone: (03) 230-4117/8. Telex: J26860 (reps for all CWCI publications except Computerworld Japan).

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (02) 4395133. Telex: AA74752 COMWOR.

Brazil: Eric Hippeau, Data News, Computerworld do Brazil, Servicos e Publicacoes Ltda., Rua Alcindo Guanabara, 25/10th Floor 20031 Rio de Janeiro, RJ Brazil. Phone: (021) 240-8225. Telex: 2130838(WORD BR).

Mexico: Richard Small, Computerworld de Mexico, Oaxaca 21-2, Colonia Roma, Mexico City 7 D.F. Phone: (905) 514-4218, (905) 514-6309. Telex: 1771300 ACHAME, 1777809 ACHAME.

Spain: Neil Kelley, Computerworld/Espana, Barquillo 21, Madrid 4. Phone: 231-23-95; 231-23-86; 231-23-88. Telex: 47894(CW E).

Denmark: Preben Engell, Computerworld/Denmark, Gammel Strand 50, 1202 Copenhagen K. Phone: 01-1234-11. Telex: 27566 cwden.

Sweden: Bengt Mamfeldt, Nova Media, Nova Media AB, Vertavagen 55, 11538 Stockholm. Phone: 08-234260. Telex: 8105099 NOVACW.

The Netherlands: Johannes A. Witvoet, Mgr. Dir., Computerworld Benelux, Van Eeghenstraat 84, 1071 GK Amsterdam. Phone: 020-646426. Telex: (844) 18242.

Italy: Daniele Comboni, Gruppo Editoriale Jackson, s.r.l., Via Rosellini 12, 20124 Milano.

Argentina: Ruben Argento, Gen. Mgr., Computerworld Argentina, Av. Belgrano 406-Piso 9, CP 1092 Buenos Aires. Phone: 34-5583/5584. Telex: 22644.

Norway: Mr. Morton Hansen, Gen. Mgr., CW Norge A/S, Hovinveien 43, P.O. Box 2862, Toeyen, Oslo 6. Phone: 2/647725. Telex: (856) 7647725.

Southeast Asia: Mr. David Naidu, General Manager, Asia Computerworld, Pte. Ltd., 11-08/11-10 Goldhill Plaza, Newton Road, Singapore. Phone: 250-4444. Telex: (786) RS 37003

Melvyn Bennett, Regional Sales Mgr., Asia Computerworld Pte. Ltd., 2023 Swire House, 9 Connaught Rd. Central, Hong Kong. Phone: 210395. Telex: (780) 72827 HX COMWR.

Saudi Arabia: Mr. Omar Dusuki, General Manager, Saudi Computerworld, P.O. Box 5455, Jeddah. Phone: 6519690. Telex: (926) 401205.

ADVERTISERS INDEX

ADP 3
AGS Management Systems 26
Alex Brown 6,54
American Computer Group 68
AT&T Information Systems 104-106
AT&T Technologies 50-51,ID/9

B I Morris & Associates Inc. 4
Bell & Howell ID/31
Boeing Computer 60
Burroughs ID/7
Business Software Inc. (BSI) 18

Candle Concepts 65
Centron DPL 78
CGA Software 16-17
Checom ID/26-ID/29
CLA 66
Cedar SR/19
Collier-Jackson, Inc. 18
Columbia Data ID/28
Connect '85 66
Computer Associates ID/30
Computer Corporation of America 28-29,54
Computer Management Research 106
Computer Source 60
Computer Systems Research 60
Computer Techniques 18
Computer Technology Group 22
Continental Resources ID/30
Control Concepts SR/15
Control Data Corp. 74-75
Corodata 44
CORS, Inc. 64,106
CTS Datacom SR/30
Calfinet 19,ID/11
CWCI 108,109
CW Enterprise 62
CW Focus SR/32
CW NASA 72-73
CW Small ID/6
CW Subscription 38
CW Sweden 60

D & B Computing Services 36,31,32
D B M S Inc. 60
Database Design, Inc. 70-71
Data Encore ID/32
Datapoint SR/9
Dataware Systems Leasing ID/34
Davis, Thomas & Associates 24
Dover Communications SR/23
DCA/Microcomp Division 66-67
DSC/ Corporate Marketing 101-106
Deltak, Inc. 66
Digital Communications Associates SR/22
Digital Controls Corp. SR/16
D.J.C. Corp. ID/22
Dow Jones News ID/30

Equitable Life Leasing SR/28
Exxon Office Systems ID/22

Falco Data SR/26
Fibronics SR/10
Fisher Isaia 63
Forte Data Systems 46-47
Fusion Products ID/60

General Datacomm Industries, Inc. 52-53,82
General Electric 14-13
General Research Corporation ID/9
Genesys Software 27
Genigraphics Corp. 100
GRID Systems Corp. 22

Hambrecht & Quist 69
H & W Computer Systems 60
Hermes International 60
Hewlett-Packard SR/18
Honeywell Information Systems ID/1

IBM ID/19,27
ICCS 60
Informatics 79
Innovative Software 12-13
Interface Systems SR/25

J.W. Lampl, Inc. 104
Lear Siegler SR/13
Lexilish ID/15
Levi, Ray & Shoup 60
Local Data SR/33

Manufacturing Technology, Inc. 34-35
Mathematica 49
MCRA ID/13
Michaels, Ross & Cole 14
MicroFrame 23,ID/21
Microlim 96-99
MIM SR/27
Micron 7
Multiplications 76

NameLab Inc. 108
NCR Corp. SR/35
NCR-ADDS 56-57
NCR-PC SR/37
Netec ID/31
Network Systems 68
Northern Telecom ID/14,SR/4-SR/5
Northrop ID/8

Panasonic SR/20
Paradyne SR/8
Philon Inc. 60
Phoenix Leasing ID/24
Pinsone & Associates ID/15
Polaroid 45
Prime Computer ID/4-ID/5,90-91
Professional Computer Research 60

Quality Micro Systems 60
Questronics 94

Racal Vadic ID/12-ID/13
Radio Shack 48
RCA/DCP SR/24
Realia Inc. ID/10
Reim Corp. SR/30-SR/31
R.R. Bowker Co. 107
RT/Katek Communications 92

Santa Clara Systems, Inc. 81
SAS Institute 24,SR/12-SR/13
Sharp SR/7
Signal Technology Inc. 37,54
Software A G 84,85
Software Engineering of America 13
Software Results 16
Startech Software Systems 23
Syncsort 3
Sys-ed 11

Tandem Computers 30-31
Teletype Corp. 63
Televideo Terminals 41
Telex SR/60
Teltone Corp. SR/11
Term-Tronics ID/8
Texas Instruments 55
Tone Software 11
Total Assets Protection SR/35
Trax Softworks Inc. ID/20

Unicalc 11
Unilogic 11
USL Data Systems 23,24

Vea-Tel 136
Virtual Microsystems SR/6
VM Software, Inc. 9

Wang Laboratories 42-43
Wyse Technology SR/31

Xyplex, Inc. SR/14

Yates Ventures ID/35

Zaiman ID/12
Zentec SR/34

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Computerworld Sales Offices

Publisher/Vice-President/Donald E. Fagan

SAN FRANCISCO SALES OFFICE (415) 421-7330
Western Regional Director/William J. Healey
Senior District Manager/Barry Milione
District Managers/Ernie Chamberlain, Mark V. Glasner, Dolores Craver
Account Manager, Classified/Nicole Boettcher
COMPUTERWORLD, 300 Broadway, Suite 20,
San Francisco, CA 94133

ATLANTA SALES OFFICE (404) 394-0758
District Manager/Jeffrey Melnick
Eastern Regional Director/Michael J. Masters
COMPUTERWORLD, 1853 Peeler Road, Suite D,
Atlanta, GA 30338

HOUSTON SALES OFFICE (713) 952-1220
District Manager/William Mahoney
Western Regional Director/William J. Healey
COMPUTERWORLD, 8401 Westheimer, Suite 110,
Houston, TX 77063

CLASSIFIED ADVERTISING (617) 879-0700
National Sales Manager/Walter S. Kott
Al DeMille
COMPUTERWORLD, 375 Cochituate Road, Box 880,
Framingham, MA 01701

CW INTERNATIONAL MARKETING SERVICES
General Manager/Diana La Muraglia
Manager, East Coast/Frank Cuttita
COMPUTERWORLD, 375 Cochituate Road, Box 880,
Framingham, MA 01701
(617) 879-0700
Manager, West Coast/Isabelle Barbagallo
COMPUTERWORLD, 1060 Marsh Road
Menlo Park, CA 94025
(415) 328-8084

Director/National Sales/Edward P. Marecki
Manager/Marketing & Sales Operations/Kathy Doyle
COMPUTERWORLD, 375 Cochituate Road, Box 880,
Framingham, MA 01701
(617) 879-0700

BOSTON SALES OFFICE (617) 879-0700
Northern Regional Manager/Ronald Mastro
District Managers/Jim McClure, Michael F. Kelleher
David Peterson, Bill Cadigan
Sales Assistant/Alice Longley
COMPUTERWORLD, 375 Cochituate Road, Box 880,
Framingham, MA 01701

CHICAGO SALES OFFICE (312) 827-4433
Midwest Regional Manager/Russ Gerches
District Manager/Arthur Hancock
Sales Assistant/Jean F. Broderick
COMPUTERWORLD, 2600 South River Road, Suite 304,
Des Plaines, IL 60018

NEW YORK SALES OFFICE (201) 967-1350
Eastern Regional Director/Michael J. Masters
Senior District Manager/Doug Cheney
District Managers/Ray Corbin, Joan Daly, Fred Lo Sapio
Sales Assistant/Mary Burke
COMPUTERWORLD, Paramus Plaza I,
140 Route 17 North, Paramus, NJ 07652

LOS ANGELES SALES OFFICE (714) 261-1230
Senior District Manager/Bob Hubbard
District Manager/Bernie Hockswender
Western Regional Director/William J. Healey
COMPUTERWORLD, 18008 Sky Park Circle, Suite 260,
Irvine, CA 92714

CW COMMUNICATIONS/INC.

Board Chairman
Patrick J. McGovern
President
W. Walter Boyd
Executive Vice-President
Lee Vidmer

Publisher/Vice-President, Donald E. Fagan. Group VP-Communication Services, Jack Edmonston. Group VP-Circulation, Margaret Phelan. VP-Finance, William P. Murphy. VP-Editorial, John Whitmarsh.

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 880, Framingham, MA 01701
Phone: (617) 879-0700, Telex: 95-1153.

SALES National Director, Edward P. Marecki. National Sales Manager/Classified Advertising, Walter S. Kott. Manager/Marketing & Sales Operations, Kathy Doyle. Corporate Advertising Administrator, Frank Collins. National Recruitment Sales Manager, Al DeMille. Display Advertising Supervisor, Anne Hadley. Display Advertising, Deborah Bryer, Pam Valentinas, Carolyn Medeiros, George W. Griffin, Doug Sanborn. Classified Operations Manager, Cynthia Delany.

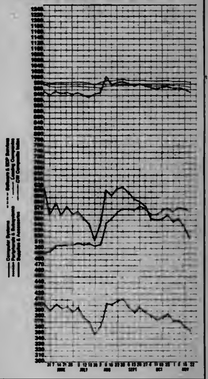
COMMUNICATION SERVICES Group Vice-President, Jack Edmonston. Director Research, Kathryn Dinneen. Sales Promotion Director, Liz Johnson.

PRODUCTION Production Director, Peter Holm. Production Manager, Marlene Stibal. Paste-Up Manager, Trish Gaudette. Systems Manager, Tom Pisu. Typesetting Manager, Carol Polack. Art Director, Tom Monahan. Graphic Designer, Hank Fling.

CIRCULATION Group Vice-President, Margaret Phelan. Circulation Manager, Jane Dezberg. Fulfillment Manager, Maureen Burke.

Computerworld can be purchased on 35 mm microfilm through University Microfilm Int., Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700. Computerworld's editorial staff or Circulation Dept. for subscription information.

Computerworld Stock Trading Index



Computerworld Stock Trading Summary

All statistics compiled, computed and formatted by TRADE QUOTES INC, Cambridge, Mass. 02139

CLOSING PRICES MONDAY, NOVEMBER 19, 1984

COMPUTER SYSTEMS

E		1983-84 RANGE (1)	CLOSE NOV 19 1984	WEEK NET CHNGE	WEEK PCT CHNGE
O	ALPHA MICROSYSTEMS	7- 24	8 1/8	0	0.0
O	ALTOS COMPUTER SYST	8- 28	8 1/2	- 3/8	-4.2
O	AMDAHL CORP	10- 28	10 3/8	- 1/2	-4.5
O	APPLE COMPUTER INC	19- 63	23 1/2	-1 7/8	-7.3
N	AT&T	15- 22	18 3/8	- 1/8	-0.6
N	BURROUGHS CORP	46- 63	53 1/8	-1	-1.8
O	COMPAQ COMPUTER CP	4- 18	6 1/4	- 1/4	-3.8
O	COMPUTER AUTOMATION	8- 37	4 1/8	- 5/8	-12.0
O	COMPUTER CONSOLES	8- 28	8 1/8	- 3/4	-8.4
N	CONTROL DATA CORP	23- 62	30 7/8	-2	-5.8
O	CONVERGENT TECHNOL	6- 41	6 1/2	- 7/8	-11.9
N	CRAY RESEARCH INC	38- 58	38 1/4	-1 1/2	-3.8
O	DAISY SYSTEMS CORP	14- 28	24 1/2	+ 1/8	+2.4
N	DATA GENERAL CORP	37- 69	57 1/4	-1 3/8	-2.5
N	DATAPOINT CORP	10- 33	14 3/8	- 3/8	-2.2
N	DIGITAL EQUIPMENT	64-125	101 1/4	-8 1/2	-7.5
O	ECCO INC	12- 16	10 1/2	- 1/8	-0.8
N	ELECTRONIC ASSOC	8- 18	6 1/2	0	0.0
N	FLOATING POINT SYST	18- 38	28 7/8	- 1/8	-0.7
N	FOXBORO	28- 47	30 1/2	- 1/4	-1.6
O	GENERAL AUTOMATION	4- 28	8 1/8	- 3/8	-4.3
N	GOULD INC	21- 38	22 1/2	- 1/2	-2.2
N	HARRIS CORP	23- 28	28 1/2	-2 3/8	-8.6
N	HEWLETT-PACKARD CO	28- 9C	34 1/2	-3 7/8	-5.5
N	HONEYWELL INC	28- 69	58 1/2	-1 1/2	-2.4
N	IBM	109-128	120	-3 1/8	-2.8
O	IPL SYSTEMS INC	2- 16	1 3/8	0	0.0
N	ITT CORP	21- 47	28	-2	-6.7
N	M/A-COM INC	18- 28	17 3/8	- 3/8	-2.1
N	MANAGEMENT ASSIST	8- 38	27	- 1/4	-0.9
N	MATSUSHITA ELEC(ADR)	30- 38	57 1/2	+8	+7.4
N	MODULAR COMPUTER SYS	8- 13	8 3/8	- 3/8	-2.0
N	MOHAWK DATA SCI	8- 17	28 1/4	+ 1/4	+2.5
N	MOTOROLA INC	29- 38	30 1/2	- 1/2	-1.4
O	NAT'L SEMICONDUCTOR	11- 28	11 1/4	-1	-8.1
N	NBI INC	10- 36	10 1/2	- 7/8	-8.1
N	NCR	21- 9C	28 3/8	- 3/8	-2.0
N	PERKIN-ELMER	18- 33	24 1/4	- 7/8	-3.4
N	PRIME COMPUTER INC	11- 28	18 1/4	- 1/4	-1.0
N	SPERRY CORP	35- 38	33 1/8	- 5/8	-1.6
O	STRATUS COMPUTER INC	8- 17	8 1/4	0	0.0
O	TANDEM COMPUTERS INC	18- 8C	17 1/8	- 3/4	-4.1
N	TANDY CORP	28- 28	28 3/8	0	0.0
O	TELEVIDEO SYSTEMS	8- 8C	3	- 1/4	-7.3
O	TELXON CORP	8- 17	10	2	0.0
N	TEXAS INSTRUMENTS	101-169	121 3/8	- 1/8	-0.4
A	ULTIMATE CORP	10- 8C	14 3/4	-2 1/2	-13.8
O	VECTOR GRAPHICS INC	0- 9	1/2	-	-24.9
A	WANG LABS 'B'	24- 42	28 7/8	- 1/8	-0.8
A	WANG LABS 'C'	24- 42	27 1/4	- 1/8	-0.4
N	XEROX CORP	38- 28	38 3/8	-1	-0.6

LEASING COMPANIES

E		1983-84 RANGE (1)	CLOSE NOV 19 1984	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE FINANCIAL CO	30- 23	28 3/4	- 1/4	-1.1
A	CMI CORP	4- 10	6	- 3/8	-5.8
O	COMDISCO INC	10- 28	11 1/4	- 3/4	-6.2
O	CONTINENTAL INFO SYS	5- 18	7	- 1/2	-6.6
N	DPF INC	10- 28	15 1/4	- 1/2	-3.1
O	FINALCO GROUP INC	4- 18	4 1/8	-1 1/8	-25.8
O	PHOENIX AMERICAN INC	4- 17	4	-1	-20.0
O	SELECTERM INC	10- 23	9 1/2	-1	-9.8
N	U.S. LEASING	29- 38	30 3/8	- 5/8	-1.8

COMPONENTS

E		1983-84 RANGE (1)	CLOSE NOV 19 1984	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED MICRO DEV	25- 8C	28	-1	-3.4
O	ADV'D SEMICONDUCTOR	16- 28	28	- 1/2	-3.0
O	ANALOG DEVICES INC	20- 33	22 7/8	+ 1/4	+1.1
A	ANALOGIC CORP	28- 35	11 3/4	- 1/2	-4.3
O	APPLIED MAGNETICS CO	8- 23	9 1/8	- 1/2	-0.1
O	MACO CORP	6- 18	2 1/4	- 1/8	-1.8
O	MICRO MASK INC	10- 19	18 3/8	0	0.0
N	TERADYNE	30- 39	23 1/8	-1 5/8	-6.3

SOFTWARE & EDP SERVICES

E		1983-84 RANGE (1)	CLOSE NOV 19 1984	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED CORP TECH	2- 8	2 1/2	+ 1/8	+0.2
O	ADVANCED SYSTEMS INC	10- 28	12	-1 1/4	-9.7
O	AGS COMPUTERS INC	20- 23	28	-1	-4.2
O	AMERICAN SOFTWARE	10- 36	13	- 1/4	-1.6
N	ANACOMP INC	2- 10	2	0	0.0
O	ANAL/SYS INTL CORP	9- 17	4 3/8	+ 1/2	-0.8
N	APPLIED DATA RES	10- 23	23 1/2	+ 1/2	+2.0
O	ASHTON TATE	8- 18	6 1/2	+ 1/2	+7.1
N	BDP COMPUTER SYSTEMS	13- 21	14	2	0.0
O	AUTOMATIC CORP IND	1- 7	1 1/2	0	0.0
O	AUTOMATIC DATA PROC	30- 38	38 3/8	- 3/8	-0.6
O	COMPUTER ASSOC CRP L	15- 28	17	- 3/4	-0.9
O	COMPUTER HORIZONS	8- 28	6 1/4	- 3/8	-0.6
O	COMPUTER NETWORK	9- 11	9 3/8	- 1/8	-1.0
O	COMPUTER SCIENCES	11- 21	18 7/8	0	0.0
O	COMPUTER TASK GROUP	10- 28	10	0	0.0
O	COMPUTER USAGE	9- 18	6 1/2	- 3/8	-7.2
O	COMPUTING SYSTEMS	4- 23	7 1/4	-1 1/2	-18.4
O	COMSERV CORP	1- 16	8 1/2	+ 1/2	+6.0
C	COMSHARE	7- 19	8 3/8	- 3/8	-4.8
N	CULLINET SOFTWARE	20- 28	28 3/8	+ 3/8	20.0
O	CYBER SYSTEMS INC	10- 29	28	+ 1/2	+8.0
O	HOGAN SYSTEM INC	8- 27	8 1/4	0	0.6
N	GENERAL ELECTRIC CO	40- 59	28 1/4	- 7/8	-1.0
N	GTE CORP	35- 40	28 3/8	-1 1/2	-3.7
N	INFORMATICS GENERAL	10- 38	28 3/8	+ 1/2	-3.1
O	INFORMATION SCIENCE	3- 17	8 1/4	0	0.0
N	INFOTRON SYSTEMS CO	23- 33	23 3/4	-1	-0.1
O	KEANE ASSOCIATES	6- 12	10	-2	-16.6
A	LOGICON	14- 8C	28	-2 1/4	-7.0
O	LOTUS DEVELOPMENT CO	19- 8C	28	-2 1/2	-9.0
N	MCI COMMUNICATIONS	9- 28	7 3/8	- 3/8	-7.6
N	MGMT SCI AMER INC	9- 29	10 1/4	0	0.0
O	MATHEMATICAL APP GRP	6- 19	8 1/2	0	0.0
O	MICOM SYSTEMS INC	31- 28	28 1/4	- 3/8	-0.8
O	MEDICORP INC L CP	8- 18	2 3/8	0	0.0
O	NATIONAL DATA CORP	8- 28	7 3/8	- 1/4	-3.1
O	ON-LINE SOFTWARE INT	6- 28	6 1/2	0	0.6
O	PANSOPHIC SYSTEMS	11- 38	13	+1 1/8	+8.6
N	PLANNING RESEARCH	20- 23	8 3/4	- 3/8	-4.1
O	POLICY MGMT SYSTS CO	18- 39	28 3/8	+ 3/8	20.0
O	PROGRAMMING & SYS	8- 9	4 1/2	0	0.0
O	REYNOLDS & REYNOLDS	20- 39	30 1/4	-2 3/4	-8.0
O	SEI CORP	11- 28	13 1/2	+ 1/4	+1.0
O	SHARED MEDICAL SYST	23- 43	33 1/2	- 3/8	-0.8
O	SCIENTIFIC COMPUTERS	8- 14	8 1/4	- 1/4	-0.5
O	SOFTWARE AG	8- 19	14 3/8	- 3/8	-4.1
N	UCC CORP	10- 13	16 3/8	- 3/8	-2.8
N	UCCEL	7- 17	13 1/2	-1 1/8	-0.1

PERIPHERALS & SUBSYSTEMS

E		1983-84 RANGE (1)	CLOSE NOV 19 1984	WEEK NET CHNGE	WEEK PCT CHNGE
P	AM INTERNATIONAL	8- 7	6 1/2	- 1/2	-9.2
N	ANDERSON JACOBSON	8- 28	8	- 1/4	-5.8
O	AUTO-TROL TECHNOLOGY	8- 39	8 1/2	+ 1/4	+3.8
O	AVANT-GARDE COMPUTING	10- 39	28	0	4.0
O	BANCTEC INC	9- 28	8 1/2	+ 1/8	+0.0
A	BEEHIVE INC L	1- 18	5/8	0	4.0
N	BOLT BERANEK & NEW	17- 39	28	0	0.0
O	CAMBEX CORP	0- 0	1 7/8	- 1/2	-0.2
N	CENTRONICS DATA CORP	9- 28	6	- 3/8	-0.4
A	CETEC CORP	7- 28	7 1/4	- 3/8	-7.2
A	COGNITRONICS	8- 28	9 1/2	0	0.0
N	COMPUGRAPHIC CORP	30- 8C	27 0 0	- 0/0	-1.3
O	COMPUTER TRANSCEIVER	3- 10	5/8	-	-0.8
O	COMPUTERVISION CORP	30- 39	28 3/4	0	0.0
N	CONRAC CORP	11- 24	14 3/8	+ 1/2	+3.6
A	DATAPRODUCTS CORP	15- 42	16 1/8	- 1/2	-0.8
A	DATARAM CORP	8- 16	4 1/8	- 1/8	-2.8
O	DATA SWITCH CORP	6- 41	8 3/4	-1	-10.0
O	DATUM INC	9- 17	9 1/8	- 3/8	-0.8
O	DECISION DATA COMPUT	8- 28	28 3/8	- 1/8	-1.3
2	DOCUTEL-OLIVETTI	9- 28	8	- 1/8	-0.4
N	ELECTRONIC M & M	8- 11	8	+ 1/8	+0.1
O	EMDATA, INC	7- 14	7	+ 3/8	-0.6
O	EVANS & SUTHERLAND	12- 28	14 3/8	0	0.0
O	GANDALF TECHNOLOGIES	8- 14	10 1/2	- 1/8	-0.9
N	GEN L DATA COMP IND	10- 38	17 1/2	- 1/2	-2.7
N	HAZELTINE CORP	16- 28	28 3/4	- 3/8	-0.1
N	ICOT CORP	8- 8	3 3/4	- 1/4	-8.2
O	INFORMATION INTL INC	30- 19	13 3/4	0	0.0
O	INTECOM INC	7- 23	8 1/4	+ 3/8	+0.0
O	INTEL CORP	27- 45	27 3/8	-1 1/4	-4.3
A	LUNDY ELECTRONICS	7- 19	8	- 1/2	-3.8
O	MEGADATA CORP	8- 19	28 1/8	- 3/8	-0.6
A	MSI DATA CORP	8- 23	9 1/8	- 3/8	-3.0
N	NASHUA CORP	18- 23	23 3/8	0	0.0
O	NETWORK SYSTEMS CORP	30- 8C	23 7/8	+ 1/8	+0.2
N	NO AMERICAN PHILIPS	30- 28	39 1/2	+ 7/8	-2.0
N	NORTHERN TELECOM LTD	30- 28	38	- 7/8	-2.3
O	OMEX	1- 0	1/8	0	0.0
N	PARADYNE CORP	11- 28	10 3/8	- 1/8	-0.8
O	PERTEC CORP	8- 14	10 3/8	+ 7/8	+7.0
N	PLESSEY CO (ADR)	37- 8C	28 3/8	-2 1/8	-0.0
2	PRINTRONIX INC	30- 38	10 1/2	- 1/2	-2.6
O	QANTEL CORP	8- 23	8	-1	-10.0
N	RECOGNITION EQUIP	30- 17	13 3/8	- 1/8	-3.6
N	ROLM CORP	30- 28	39 3/8	- 1/2	-1.7
N	SANDERS ASSOCIATES	30-120	39	-1 3/8	-4.6
O	SCAN DATA	1- 0	1/2	0	0.0
O	SCAN-TRON CORP	8- 13	11 3/8	- 1/2	-1.0
N	SCIENTIFIC ATLANTA	8- 23	8 3/8	+ 1/8	+1.6
O	SEAGATE TECHNOLOGY	8- 28	4 3/8	2	0.0
N	STORAGE TECHNOLOGY	8- 23	2 7/8	- 3/8	-11.0
O	SYKES DATATRONICS	1- 10	1 3/8	+ 3/2	+27.0
O	SYSTEMS & COMP TECH	30- 28	28 1/4	-1 1/4	-4.8
A	T BAR INC	7- 17	7 1/2	- 1/2	-6.6
O	TAB PRODUCTS CO	13- 28	28 1/8	- 1/4	-4.8
O	TANDON CORP	7- 28	6 3/8	- 1/2	-5.6
O	TEC INC	8- 12	8 7/8	- 1/4	-2.7
N	TEKTRONIX INC	30- 28	57 5/8	- 3/8	-5.6
N	TELEX	10- 28	38 1/4	- 3/4	-0.3
O	TESDATA SYSTEMS CP	8- 27	2	- 1/4	-11.1
N	TIMEPLEX INC	13- 28	14 1/2	+5	28.0
2	VISUAL TECHNOLOGY	8- 28	8 3/4	+ 1/8	+0.7

SUPPLIES & ACCESSORIES

E		1983-84 RANGE (1)	CLOSE NOV 19 1984	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN BUS PRODS	17- 23	28 1/8	+ 1/2	+0.2
N	BARRY WRIGHT	23- 33	27	- 1/4	-0.0
A	DUPLEX PRODUCTS INC	30- 27	29 1/8	- 1/4	-0.9
N	ENNIS BUS FORMS	10- 28	23 3/8	0	0.6
N	3M COMPANY	30- 28	79 7/8	-2 1/2	-0.0
N	MOORE CORP LTD	30- 33	39 1/2	- 1/2	-0.0
O	STANDARD REGISTER	27- 40	8C 1/2	0	0.0
N	WALLACE BUS FORMS	23- 39	29 3/8	0	0.0

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON; L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Ven-Tel's 212 PLUS

Smarter Than Smart!

Finally, There's A Smart Modem For Both Terminals *and* P.C.'s!

Two Modems in One!
Whether your work station is a dumb terminal, intelligent terminal, or full-fledged P.C., Ven-Tel's 212 PLUS is your best choice!

It's A Terminal Modem!
In terminal mode, the 212 PLUS stores your phone numbers, manages computer connections (with sophisticated dial-routing routines)—even has its own built-in HELP commands.

It's A P.C. Modem!
With a flip of a switch, you're in 'AT' mode, for immediate compatibility with all popular personal computer communications software including Crosstalk™ and Smartcom II.™

Compare!
We think you'll agree that the 212 PLUS is the smartest modem around. Call us for the location of your nearest Ven-Tel distributor.

Ven-Tel Inc.
Effortless Communications

2342 Walsh Avenue
Santa Clara, CA 95051
(408) 727-5721

Crosstalk is a trademark of Microstuf, Inc. Smartcom II is a trademark of Hayes Microcomputer Products, Inc. 212 PLUS is a trademark of Ven-Tel, Inc.